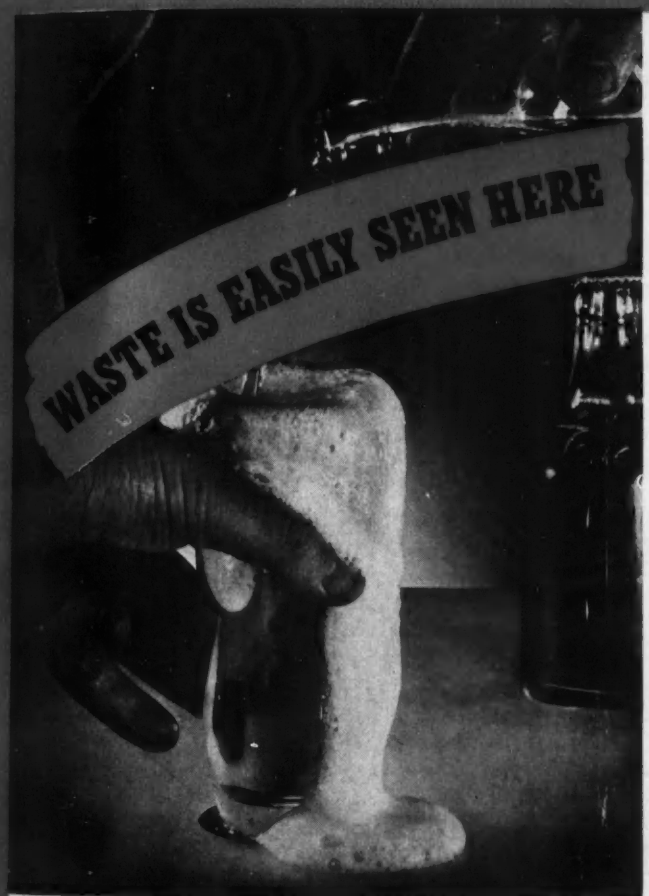
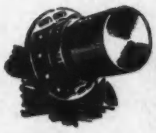
PAPER TRADE JOURNAL

MAY 2, 1940





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Vol. 110, No. 18 Thursday, May 2, 1940 Price Ten Cents

Canadian Newsprint Exports Rise in March

Exports of Newsprint From Canada For March Up 740,000 Tons Over February But Below March 1939—Wood Pulp Exports For First Quarter Nearly Doubled For Same Period—Outlook For Consolidated Good.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 29, 1940—Figures just released from Ottawa show exports of newsprint from Canada in March to have been up some $740,000 from the February figures but somewhat lower than in March, 1939. The total for the month amounted to 4,113,105 cwt., valued at $8,984,203, as compared with 4,353,075 cwt. valued at $8,388,061 in March, 1939. For the first three months of this year the total now stands at 12,387,935, valued at $27,012,093, as compared with 11,274,234 cwt., valued at $24,211,833 in the first three months of last year. As against the recession in the March figures compared with those of a year ago, there was another sharp increase in the exports of wood pulp, which amounted to 1,370,275 cwt., valued at $3,547,991 of this total 672,918 cwt., valued at $2,014,292 consisted of bleached sulphite. The total exports of wood pulp in March, 1939, amounted to 1,066,215 cwt., valued at $2,513,609. For the first three months of this year the total exports of wood pulp amounted to 4,567,157 cwt., valued at $11,267,682, as compared with 2,736,384 cwt., valued at $6,523,274 in the first three months of 1939.

Prospects Good for Consolidated Paper

At the annual meeting of the Consolidated Paper Corporation in Montreal, L. J. Belnap, president, said that the 1939 results were the best for any year since the inception of the corporation. He remarked that prospects at present appear promising but qualified this by saying that prices of practically all raw materials, as well as labor, fuel and taxes, had risen and that, accordingly, costs for the year would be considerably higher. Under present conditions and with the ever-changing problem of shipping to overseas, a forecast would have little value, he added. It was stated that payment of the July 2 installment of interest on the corporation's bonds in cash, rather than in stock, is unlikely.

Mr. Belnap derw attention to the reduction in current bank loans of $6,156,617, a substantial part of which was due to liquidation of inventories. He said that during the first quarter of this year, all bank loans had been paid. In addition to this, final sinking fund payment on the Ha Ha Bay Land and Building Company had been paid and this company is now consolidated with the parent company. He said that by April 30 next final sinking fund payment on the Wayagamack News Company will be paid and this company similarly consolidated with the parent company, the two transactions discharging the funded debt of all subsidiaries.

President Belnap Reviews Conditions

Proceeding to a general review of the situation, Mr. Belnap said that during 1939 newsprint mills operated at 56 per cent of rated capacity and this percentage had been continued during the first quarter of the current year, which was about 10 per cent above the corresponding period a year ago.

In dealing with the relative importance of the newsprint industry, Mr. Belnap emphasized that 1939 exports of newsprint totaled $115,600,000, compared with wheat exports valued at $109,000,000. And exceding in value all other commodities with the exception of gold. He said that in 1939, the pulp and paper industry contributed almost 60 per cent of the excess of exports over imports, amounting in total to about $175,000,000 Canadian funds. With these facts in mind, the Consolidated Paper president said "our federal and provincial governments and the public should give more serious consideration to the relative economic importance of the existing pulp and paper business and encourage it at least to a comparable degree with wheat and other products."

Mr. Belnap said much public comment has been made regarding additional income from exchange. He said "some benefit in recent months has accrued to the industry, but it is only a transitory benefit and should not be reckoned on in taking a long view of future earnings."

Directors were re-elected.

Oxford Earns $136,827

The Oxford Paper Company for the quarter ended March 31, reports a net income of $136,827, or 2 cents a common share; for same 1939 quarter, net income $111,615, or $1.11 each on $5 preferred stock.

Midwest Trade Reports Strong Paper Market

Critical Pulp Situation Creates Firm Paper Market and Improved Volume of Orders With Kraft Paper Reported Very Strong—New Salesmen's Group Planned—Paper Merchants Consider "Use Tax" Law—Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., April 22, 1940—While the press is full of reports on the pulp situation, the local paper market itself is reported to be proceeding in very orderly fashion. Reports that several mills have withdrawn their prices are current in this area but the chief concern here seems to be to get prices back to the list basis in cases where the slackness of the past few months have resulted in unevenness. It is expected that this "stiffening" process will continue for the next thirty days after which a general movement upward must be expected. Naturally, the tone is very strong and buying orders are much more prevalent today than two weeks ago.

Kraft continues to be very strong according to reports while sulphites are likewise showing a gradual firming up all along the line. Books and covers showed increased interest and here, again, the trend was to the top position in the list prices. Bonds and ledgers were reported as firming up. Newsprints and groundwoods moved in sympathy with the general list. The board market indicated a better demand though building activities continued to move slowly with the unseasonable weather. Waste papers continued weak.

Plan New Salesmen's Group

The initial meeting of the Chicago Association of Fine Paper Salesmen was held on April 11. The purpose of the meeting was to determine whether or not the majority of the fine paper salesmen in the Chicago district were in favor of forming an organization to coordinate local activities. More than two-thirds of the wholesale paper houses were represented by either executives or salesmen and at the end of the meeting were reported as in thorough accord with organization plans. According to C. H. Roeser, the salesmen are deeply concerned regarding their future and it is believed that an organization of salesmen can do a great service to themselves and to the paper industry. "The wholesale paper houses," reports Mr. Roeser, "may have to justify their existence in a new scheme of merchandising due to economic changes." The purpose of the Association is reported as threefold—educational, social and cooperative. A determined effort will be made to create better feeling and to promote sound business practices to help insure the future of the paper industry. The next meeting of the Association is being held this week. April 18, at which it is expected officers will be selected and a specific program adopted.

Dairy Loses Paper Carton Suit

Fieldcrest Dairies, Inc., lost its fight for an injunction aimed to force the city of Chicago to permit the sale of milk in paper containers this week when the master in chancery recommended that the Federal Court should not encroach on the city's legislative domain. The decision ended a fight begun four years ago when the dairy company was refused permission to retail milk in paper cartons in Chicago. Early in 1939 Fieldcrest filed suit in Federal court seeking to restrain the city from interfering with the use of paper containers. While the hearings were dragging along the Board of Health approved the cartons and a proposed ordinance was drawn up that is still pending before the City Council.

Paper Merchants Consider Tax Law

Certain important paper distributors in Chicago are beginning to consider the possibility of urging the adoption of a "use tax" law in Illinois following close study of the effects of Revised Article 5 of the Retailers Occupation Tax. While the new article is designed to give the State Department of Finance the right to tax all interstate shipments regardless of origin if the sale is consummated in Illinois, there remain the telephone and mail order business secured across the State lines which is as yet not taxable. This business, available to Illinois paper consumers without payment of the tax, is a serious handicap to Illinois paper merchants as well as to "foreign" paper houses who maintain sales offices and outlets within the State. For this reason and because they have no particular quarrel with the principles of Revised Article 5 as such, several paper houses believe that all paper outlets should be under the same restrictions. Thus they are seeking passage of a "use tax" which would tax the usage of the paper in this State regardless of point of origin or ability or non-ability to have jurisdiction over the seller. The paper houses may get more than ordinary consideration of their problem as the special session of the Illinois Legislature convenes on April 30 to discuss, among other things, ways and means of financing increased old age assistance in Illinois. If, in casting about for methods of raising new tax levies, the Legislature runs across the "use tax" principle, Chicago and Illinois paper houses may have relief more quickly than they have perhaps realized.

Edward Carpenter Heads Swigart Co.

Edward A. R. Carpenter has been elected vice president of the Swigart Paper Company according to an announcement circulated in Chicago paper circles this week. Mr. Carpenter, widely known in paper distributor circles, became identified with the Swigart organization in 1932. Prior to that time he was engaged in the wholesale paper business in Grand Rapids, Michigan.

Students Visit Falulah Mill

BOSTON, Mass., April 29, 1940—A group of about 30 students of the Wentworth Institute School of Printing here were shown through the mill of the Falulah Paper Company, Fitchburg, Mass., April 24, by Walter E. Lane, sales manager. The party was under the charge of John E. Mansfield, printing instructor at the Institute and was accompanied by John C. Hurd, of Knight, Allen & Clark, Inc., who arranged for the party.

Consolidated Co. Signs Annual Workers

No Change In Wage Schedules Involved In Twenty-second Annual Working Conditions Signed By Consolidated Water Power & Paper Co. Effective May 1—Harold Skinner Granted Patent — Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., April 29, 1940—Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., signed its twenty-second annual working conditions agreement last week, between the company and the union employes of its four divisions at Wisconsin Rapids, Stevens Point, Biron and Appleton, Wis.

Effective May 1, the agreement involves no change in wage schedules, since increases had been granted in February, and only minor alterations were made in certain clauses. The company previously fixed the base hourly rate at 56 cents, an increase of three cents per hours in the lower brackets, two cents per hour in the upper brackets, and two cents per hour for women. Rates apply except for new employees, who receive a 53-cent scale for the first six months.

Executives Represented in Negotiations

Company executives represented in the negotiations were Stanton W. Mead, operating manager; Leo J. Barrette, general employment manager, and the mill managers: C. E. Jackson, Wisconsin Rapids; Warren Beadle, Jr., Biron; C. K. Boyer, Appleton, and Harry Adrian, Stevens Point. Representatives of four AFL international organizations were: Raymond Richards, International Brotherhood of Pulp, Sulphite and Paper Mill Workers; E. A. Noren, International Brotherhood of Paper Makers; E. J. Brown, International Brotherhood of Electrical Workers, and A. J. Hayes, International Association of Machinists.

Officials of the Stevens Point division of Consolidated announced last week that construction will begin at once on a storage addition. The building will be 112 by 37 feet, three-story, and of brick exterior. It will have elevator service, and will be used principally for pulp storage.

Harold Skinner Granted Patent

Harold A. Skinner of the Marathon Paper Mills Company, Rothschild, Wis., has been granted a patent covering a new method of packing wood chips in pulp mill digesters, featuring 14 separate new ideas. The method has been used in Marathon mills for the last three years, and provides for piling chips in the digesters instead of dumping them in a mass. Twenty percent more chips can thus be treated at one cooking, increasing production and saving on chemicals. Application for the patent was filed July 15, 1938, and rights have been assigned to Marathon mills. Mr. Skinner is also inventor of a pulp fiber weatherstripping for windows and doors. The product is now being manufactured by Marathon mills and sold through an outside distributor. Sales began last fall.

State Has 16 Million Acres of Forest Lands

Wisconsin has a total of more than 16,000,000 acres of land available for forests, according to Dr. H. W. Wheeler, chief lecturer of the United States Forest Service. These lands are suitable neither for farms nor pasture, and he advocates an enlargement of the reforestation program. There is need for further fire protection, he says, since 2,156 fires in 1939 burned 10,119 acres of forest and woodland.

Johnston-Boettcher Engagement

The engagement was announced last week of Gerald K. Johnston, chemist for the Waldorf Paper Products Company, St. Paul, Minn., and Miss Doris Boettcher of Appleton, Wis. Mr. Johnston received his master of science degree from the Institute of Paper Chemistry, Appleton, Wis., and is being granted his Ph.D. degree there this June. Miss Boettcher has been employed as a secretary at the Institute.

Exams for U. S. Regional Laboratories

The United States Department of Agriculture will make a large number of appointments in the new Regional Laboratories for Research on Utilization of Farm Products as the result of examinations soon to be announced by the Civil Service Commission. In the Agricultural Residues Division and others, there will be a number of positions open for men with experience in the pulp and paper industries and for men having special knowledge of lignin.

The examinations will be held in the grades from P-2 ($2600), assistant chemist and assistant chemical technologist, to P-5 ($4600), senior chemist and senior chemical technologist. During the next 2 years about 400 appointments to regional laboratories will be made from Civil Service registers established through these new examinations. Positions will be filled requiring the services of organic, physical, and analytical chemists, and others in the fields of carbohydrate chemistry, and chemical engineering, as well as in a number of other fields. It is hoped that anyone now interested or who is likely to be interested in a position in these laboratories will endeavor to become eligible for appointment, even though he may not be able to accept a position at present.

Appointments in these laboratories can be made only as a result of Civil Service eligibility established through examination. All inquiries should be addressed to the United States Civil Service Commission, Washington, D. C.

Storrs & Bement to Exhibit

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., April 29, 1940—Among the companies to have an exhibit at the Rhode Island Packaging Show, to be held in Memorial Hall, Providence, May 1-3, is the Storrs & Bement Company. On April 30, from 7-10 p.m., the presentation of awards will be made. May 1, at 8:15 there will be an illustrated lecture on "Modern Packaging" and on May 3, a Panel Discussion. The show will be open from 10 a.m. to 10 p.m. The Providence Chamber of Commerce and the Rhode Island School of Design are sponsors of the affair.

Meyers Continuous Water Feed Controller

By S. E. Meyers[1]

The pulp and paper industry constantly uses a group of mechanically related pulping and refining equipment in which dry or semi-dry stocks of various natures are charged, more or less continuously, with the simultaneous admission of water under manual control, and in which the stock is continuously extracted by one means or another.

Broadly, these equipments are known as "continuous breakers" commonly used in board mills for pulping dry stocks, "broke beaters" used in all sorts of mills for pulping machine broke, trim, etc., continuous "mixers" commonly used for pulping the various lapped stocks, "washers" in which water alone is continuously admitted and extracted as a means of removing various undesired solutions, suspensions or both.

Control of Water Admission

The control of water admission to these typical units is normally in the hands of semi-skilled or unskilled men who do the best they can to maintain uniform conditions within the tubs. That this is impossible, even for a most skilled attendant, is obvious and, as in many processes, can be realized only through the medium of properly applied automatic means. With such means available, wide density variations in stock from this family of continuous engines can be eliminated. This is particularly true of broke beaters often placed in the basement without attendance except when somebody happens to think about it. Let the machine "go in the hay" and the broke beater is indeed far from forgotten as far as broke disposal is concerned, but when "haying time" is over, somebody forgets it again until the machine chest is found full of water or the beater overflows to the surrounding territory.

The necessary irregularity of feed to large breakers makes them difficult to regulate by hand. Uncertain water supply, full chests overflowing back to the beater, various sources of water supply, differing classes of stock, all tend to irregularity, not to mention the temptation to fill the chest with-something-before going off duty. These difficulties apply with equal force to the so-called mixers having paddle wheels as pulping and circulating mediums.

[1] Chief Engr., Process Controls Inc., LeRoy, N. Y.

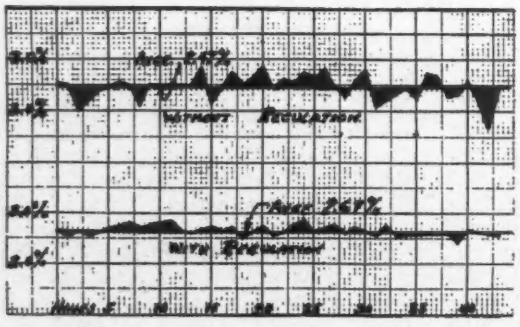


Fig. 1.

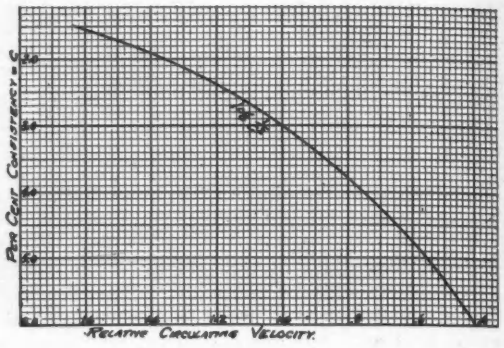


Fig. 2.

Washer Regulation Less Troublesome

Washer regulation is less troublesome because the addition of dry stock during the washing phase does not normally involve the addition of stock; it is merely the replacement of discharged unclean effluent by fresh water. But here, too, there is an optimum density for the best results in the shortest time. The operator tries to set the fresh water feed to balance outflow. Maybe he hits it; usually he doesn't. In the latter case the beater runs low and heavy, or it becomes light and likely to overflow. Automatic water feed results in maximum rate of washing at known density, with water feed at exactly the same rate as drainage.

Fig. 1 is a chart showing consistency from a 125 ton Shartle Breaker in an Eastern board mill. The upper chart gives variations in density with hand water feed. They are sharp and swing nearly one-half per cent over and under average, with one point one and one-quarter per cent below maximum. The lower chart gives consistency readings from the same beater with a Meyers Water Feeder controlling water input. Here the average density is higher, the swing is from 2.85 per cent to 2.5 per cent with one point showing 2.4 per cent low. Thus the maximum swing at one point only was .45 per cent, the average swing being .35 per cent; from .18 per cent high to .17 per cent low. The latter third of these readings is extremely uniform. Incidental to this, power consumption was smoother, water demand far more uniform, water temperature tremendously improved with consequent flattening of steam demand at the heaters. There is no settling system following this breaker and the machine tenders report a great improvement in machine operation and board weight.

Even if a breaker is followed by a settling system, these advantages hold good with the additional fact that settling is far more uniform and certain at a constant best density depending on the stock. Thickeners will operate and deliver stock uniformly, and the newer type of centrifugal dirt removers will operate at their best. The effect of uniform density at jordans, screens, paper machine and, lastly, at the driers cannot be denied. If all of the filler stock comes from a breaker, then all of the steps following are affected by uniformity or the lack of it.

In pulpers of the type mentioned herein, it is well known that the speed of stock circulation is directly affected by and functional with density, viz., the heavier the stock, the slower the circulation, and vice versa.

Density and Circulation Speed

Fig. 2 illustrates the relation between density and circulation speed. Observations indicates that the speed varies, approximately as:

$$\log \frac{1}{C^2}$$

If the speed at 3 per cent is 100 FPM, at 2.75% it will be ±107 FPM. and at 3.25% it will be ±93 FPM. Thus ¼% variation in density will reflect a ±7% difference in stock velocity, all other conditions being equal.

Fig. 3 is an isometric view of the Meyers Continous Water Feed Regulator. An air tight metal roll having radial blades is carried on suitable bearings at the end of a steelyard. The weight of the roll, attachments and frame is counterbalanced as shown so that the roll floats upon the surface of the stock with only the blades submerged. The tilting support bearing is also adapted to swivel so that the roll will ride over wads or bales of unreduced stock regardless of where they come in the length of the roll. Thus the roll and frame can adapt themselves to varying stock levels and unevenness of stock surface. The support member spans across the stock channel and is supported by the upper rims of the tub.

As the floating roll is driven by the circulating stock, its angular velocity will equal the lineal velocity of the stock, the latter of which depends upon density.

Rotation of the Roll

Rotation of the roll is transmitted by an enclosed chain drive through shafts and small bevel gears to drive a two cylinder pump shown in section by Fig. 4. The pump is extremely simple consisting of opposed plungers deriving their motion from an eccentric cam engaging their inner faces. The inward or suction stroke is derived from springs which also function to keep the plungers against the cam face. Low lift aluminum disc valves function in the usual manner to direct flow, and the rate of discharge is proportional to pump speed.

At the top of the eccentric housing is an opening

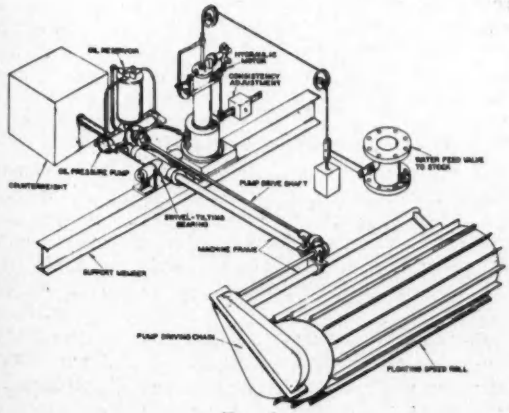


FIG. 3.

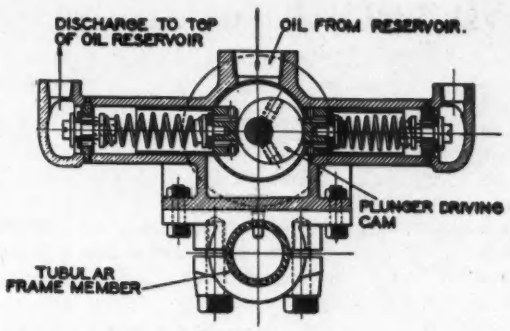


FIG. 4.

which communicates with a reservoir shown clearly by Fig. 3. The reservoir, having about two quarts capacity, is filled with a 50-50 mixture of lubricating oil and kerosene. Thus the eccentric cam, pump bearings and plungers are running at moderate speed in an oil which, while dilute, retains sufficient lubricating qualities to protect all running surfaces.

The oil is discharged upward from the outer ends of the pump cylinders to a common port in the cover of the oil reservoir shown by Fig. 5. It then discharges through an adjustable orifice valve and returns to the reservoir through a return pipe discharging beneath the oil surface. Should excess pressure occur for any reason, the relief valve lifts to discharge it into the reservoir.

It will be seen from the above that the oil being discharged through an orifice, and its volume being proportional to pump speed, its pressure will vary as the square of the volume pumped. We have then, in effect, a speedometer in which oil pressure is functional with stock speed which, in turn, is functional with density.

Operating Main Admission Valve

It now becomes necessary to translate the varying oil pressure into means for operating the main water admission valve. Referring again to Fig. 3, a hydraulic cylinder or motor is mounted adjacent to the oil pump. The enlarged round base of this motor contains a seamless brass sensitive bellows having its top head pre-loaded by the lever and weight. As the entire roll frame and pump are continually wobbling, due to stock surface irregularities, oil pressure from the port in the cover of the oil reservoir is transmitted through a neoprene hose to the inside of the bellows. Thus the bellows expands or contracts with oil pressure under the limitations of the loading weight and lever. The valve gear of the hydraulic

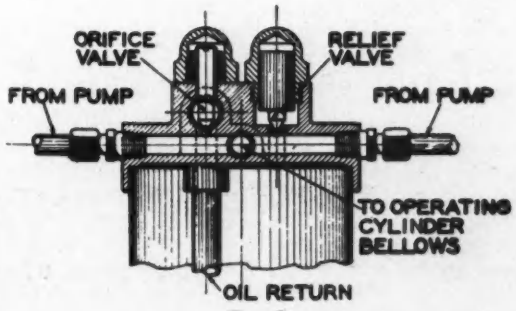


FIG. 5.

motor is so arranged that the main piston travels an amount exactly proportional to bellows movement. This assembly, then, becomes a powerful proportional relay which operates the main water feed valve admitting water to the stock. Consistency adjustment is obtained by moving the weight in or out on the bellows lever.

In operation, as dry stock is fed to the beater, it tends to become heavier, slowing down stock circulating velocity. The controller immediately steps in to make up water deficiency and adds water as needed to maintain circulating speed. If stock is added rapidly, the device will add water correspondingly rapidly—stoppage of stock feed will cause closure of the water valve as soon as absorption ceases. In ragging a breaker, circulation is temporarily interrupted causing the water valve to open and decrease the consistency. This peculiarity is deemed advisable and automatically occurs. In short, the manual handling of water is taken entirely out of the hands of the operators with the advantages given previously in this article.

In the case of washers, the controller functions to replace water at the same rate it is removed by the screen. Consequently, washing is speeded up because water inlet can be maintained at a maximum without danger of flooding the tub. More than this, once the controller is set, the consistency will be extremely uniform from batch to batch.

Other Possible Applications

Other applications to which this device might be applied, but have not as yet, are the adjustment of density in circulating chests and Bellmer bleachers. In fact, at any point where stock moves in an open channel, and in which the speed of such flow is affected by density, this device is applicable to hold the density *within* plus or minus one-quarter of one per cent.

Great Northern Increases Wages

FORT EDWARD, N. Y., April 29, 1940—John P. Burke, president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, has returned from a conference with officials of the Great Northern Paper Company, at Boston, Mass. He announced that the company has granted a general increase in wages to all union employees amounting to two cents an hour and a week's vacation with pay to all employees who have been in the employ of the concern for a year or more. These vacations will start this year. The company's large mills at Millinocket, East Millinocket and Madison, Me., it is understood, all will be affected by the increase. It was also stated by Mr. Burke that union organizations in the pulp and paper industry will endeavor this year to obtain a week's vacation with pay in all mills in this country, Canada and Newfoundland.

Trials of a Newsprint Mill

Under the title of "Running hard to keep in the same place," Royal S. Kellogg, secretary of the Newsprint Service Bureau, New York, has an article of general interest in the May issue of the *Sphere*. The article gives many interesting details of the personal history of a newsprint mill and how its management has succeeded in meeting many of the trials and tribulations of manufacturing newsprint at slightly higher cost than twenty-four years ago.

Hans Lagerloef Made Colonel

At a brilliant function on the evening of April 26 at the old Seventh Regiment armory at 643 Park avenue, New York, a portrait of King Gustaf III of Sweden who reigned from 1746 to 1792 was presented

COL. HANS LAGERLOEF

to the 107th Infantry, New York National Guard by the infantry regiment of Gotland. The presentation was made by Hans Lagerloef, president of the Lagerloef Trading Company, 52 Vanderbilt avenue, New York, who was made an honorary colonel of the regiment.

Paul G. Cook Goes to New York Office

Paul G. Cook, vice-president and sales manager of Rochester Paper Company has transferred his headquarters from the mill offices at Rochester, Mich., to the offices this company maintains at 41 Park Row, New York, N. Y.

Mr. Cook will continue to represent the company in the various territories which he has been covering for the past several years, without change and will continue to direct the sales, advertising and promotion policies of this company's line of blotting papers, moving to the New York address largely because of the growing responsibilities of the Rochester Paper Company in the New York and Philadelphia, and other Eastern markets.

Fred W. Beetson, who has been representing Rochester at this office ever since it was established eleven years ago, continues in charge of metropolitan and New England sales.

Weightometer at Fernandina Mill

The Merrick Scale Manufacturing Company, manufacturer of automatic continuous weighing machines, Passaic, N. J., has a weightometer installed at the plant of Rayonier, Inc., at Fernandina, Fla. This piece of equipment is on the belt conveyor weighing the chips to the digesters and with remote totalizing counter. The operator delivers chips to each digester as required in a weight amount determined by the weightometer, and with this control over the charge of chips, it is said, a more uniform yield results from each digester.

Improved!

BELOIT HORIZONTAL *Dual Press*

PATENTS . PENDING

● The Beloit Horizontal Dual Press has been improved by incorporating a primary roll over the first suction press, adding another nip. Thus, this press is now equivalent to three presses instead of two, the first suction roll doing double duty.

● The success of the Beloit Horizontal Dual Press has been definitely established. This new press gives even better results.

THE BELOIT WAY IS THE MODERN WAY

BELOIT IRON WORKS BELOIT WISCONSIN

Mich. Superintendents Hold Ladies' Night

KALAMAZOO, Mich., April 24, 1940—The Annual Ladies' Night party sponsored by the Michigan Division of the American Pulp and Paper Mill Superintendents Association was held at the Park American Hotel on Saturday evening, April 20. The attendance exceeded any previous party and was due to the efficient work of the committee in charge.

Walter B. Hadley Is Toastmaster

Walter B. Hadley was this year's selection as toastmaster, and his ability in handling the job showed excellent judgment on the part of those who chose him. The entertainment consisted of an exhibition put on by Walter Z. Harris, a local magician with a national reputation. Dancing followed the dinner and floor show with music by a local band. Favors for the ladies were furnished through the courtesy of the Sutherland Paper Company.

Those in Attendance

The following were among those who attended:—

Mr. and Mrs. R. L. Eminger, National Secretary, Miamisburg, Ohio, Mr. and Mrs. J. R. Verdon and Miss Helen Little, American Cyanamid & Chemical Company; Thomas Shinners and Mr. and Mrs. Frank F. Schmiege, American Wire Cloth Company; Mike McMahon, Appleton Woolen Mills; Mr. and Mrs. W. A. Kirkpatrick, Mr. and Mrs. Ed Osborn, Mr. and Mrs. Ivan Randall, Mr. and Mrs. H. B. Johnston, Mr. and Mrs. J. H. Weber and Mr. and Mrs. Carl W. Swanson, Allied Paper Mills; Mr. and Mrs. Otto Fisher, Mr. and Mrs. Kent Kidder, Mr. and Mrs. Leo Willoughby, Mr. and Mrs. Noah W. Bryant and Mr. Wayne Crotty, Bryant Paper Company; C. R. Meyers, Dilts Machine Company; Mr. and Mrs. L. H. Breyfogle, Draper Brothers Company; Mrs. Paul Fortier, Everett Pulp and Paper Company; Mr. and Mrs. O. W. Callighan and Tom Falknor, Edgar Brothers Clay Company; A. S. Cline, Glidden Company; Mr. and Mrs. L. J. Lynd, General Electric Company; Mr. and Mrs. F. L. Zellers, French Paper Company; Mr. and Mrs. D. Howard, H. P. Smith Paper Company; E. M. Cowling, Mr. and Mrs. Fred Hodgemire and Mr. and Mrs. John Tooker, Hawthorne Paper Company; Mr. and Mrs. Fred Shankweiler, Mr. and Mrs. Arthur G. Dreis, Mr. and Mrs. L. E. Fitzgerald, Mr. and Mrs. Robert Buss, Mr. and Mrs. Hoke Martin and Henry Reeves, Jr., Hercules Powder Company; Mr. and Mrs. Dave Klausemeyer, Illinois Envelope Company; Mr. and Mrs. James Wise, Mr. and Mrs. F. L. Denner, Mr. and Mrs. L. H. Nimms and Mr. and Mrs. J. W. Cansey, Kalamazoo Paper Company; Mr. and Mrs. M. C. Olmsted and Mr. and Mrs. B. Longnecker, Kalamazoo Stove Company; Mr. and Mrs. J. H. Noble, Mr. and Mrs. A. B. Perlick, Mr. and Mrs. John Hartman, Mr. and Mrs. L. H. LaLiberte and Mr. and Mrs. Geo. Rice, Kalamazoo Vegetable Parchment Company.

Ed. J. Thorn, Mr. and Mrs. Frank Libby and Robert Stewart, Howard Smith Paper Mills; Mr. and Mrs. Arthur Weinland, Lee Paper Company; Mr. and Mrs. Raymond L. Barton, Mr. and Mrs. B. S. Hobson, Mr. and Mrs. A. E. Hayes, Mr. and Mrs. C. A. Braginton, Mr. and Mrs. Merton Fogerty, Mr. and Mrs. N. Clowell, Mr. and Mrs. Wm. H. Astle and Mr. and Mrs. J. W. Sullivan, Michigan Paper Company; Mr. and Mrs. S. U. Cottrell, National Aniline and Chemical Company; Mr. and Mrs. H. C. Pearson, Pioneer Paper Stock Company; Mrs. Helen King, Jennie Konkle, Mr. and Mrs. A. W. Cole, Mr. and Mrs. Henry Nendorf, Mr. and Mrs. John Whalen, Mr. and Mrs. Roy L. Ward, Mr. and Mrs. Edward Noble, Mr. and Mrs. Arthur Van Emst, Mr. and Mrs. W. G. Curry, Mr. and Mrs. Hod Heath and Alfred Noble, Rex Paper Company; Mr. and Mrs. A. W. Riedel, Gus Riedel & Sons; Mr. and Mrs. A. J. Coetz, River Raisin Paper Company; Mr. and Mrs. Mongreig, U. S. Rubber Company; E. J. Moran, Sprague Warner Company; Mr. and Mrs. C. H. Noble and C. H. Noble, Jr., A. E. Staley Manufacturing Company; Mr. and Mrs. Walter Hadley, Mr. and Mrs. Arnold Weller, Mr. and Mrs. A. L. Sherwood and Mr. and Mrs. Glen Sutton, Sutherland Paper Company; Mr. and Mrs. Arthur Coffin, Titanium Pigment Company; Marge Dickson, R. T. Vanderbilt Company; Mr. and Mrs. L. L. Griffiths, Jr., Williams Gray Company; Mrs. Roy Holden, Stowe Woodard Company; Mr. and Mrs. Roy Mennier, Eddy Paper Company; Mr. and Mrs. Jacob Parent, Noble & Wood.

Miss Frances L. Hays, Mr. and Mrs. J. C. Widmeyer, Mr. and Mrs. Chas. E. Roney, Mr. and Mrs. George Silmo, Mr. and Mrs. Leo Ehrman, Raymond W. Fox, H. E. Stafford, Gordon Markle, Miss Audrey Case, Miss J. Marie Brown, Miss Dorothy Rantz, Miss Carlita Broughton, Miss Edna Thorne, Miss Maxine Sharp, Miss Jane Thompson, Miss Katherine Whalen, Miss Ann Shaw Stewart and Miss Arlene Ruinveld.

Delaware TAPPI to Meet at Philadelphia

The Delaware Valley Section of the Technical Association of the Pulp and Paper Industry will meet at the Engineers Club, Philadelphia, Pa., at 6:30 P.M. on May 10, 1940.

A paper entitled "Wetting Agents, Their Structure, Characteristics, and Uses" will be presented by C. A. Sluhan of the American Cyanamid and Chemical Corp. The paper will describe the differentiation between dispersing agents, wetting agents, and detergents, reasons why wetting agents work as they do, methods of testing wetting power, a discussion of various types of wetting agents and examples of how wetting agents are being used in the paper and in other industries.

The subject of wetting agents and surface active chemicals is of great interest. All TAPPI members and others interested should attend. For further information or reservations, write C. A. Shubert, Dill & Collins Inc., Philadelphia.

To Represent Filer Fibre Co.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., April 29, 1940—P. H. Lane, mill agent, has become representative of the Filer Fibre Company, Filer City, Mich., producer of pure Northern sulphate, kraft paper and specialties.

SPADEWORK...

THERE'S simply no getting away from it. If Adolphus Q. Bickle wants to win that tulip award he's after, the only way he will do it is by more and better spadework.

Here at Shell our lubrication men never try to get away from the preliminary digging that cuts the cost of friction in industry. Every day they go out in search of it.

You will find Shell lubrication men in a Detroit machine shop conducting a test run with an improved cutting lubricant . . . in a Carolina paper plant studying the possibility of improving dryer-roll lubrication. Or checking the effect of lubricating oil in relation to exhaust-port carbon formation and operating temperature in a marine Diesel. Or you will find them investigating the reaction of a new type of extreme pressure lubricant on screw-downs on a blooming mill.

It's this first-hand digging that enables Shell refineries to produce lubricants keyed to the needs of your machines *today.*

Perhaps Shell can help with your lubrication problem. Why not call in your Shell man today?

SHELL

SHELL INDUSTRIAL LUBRICANTS

Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 1, 1940—Paper Corporation of U. S. has been awarded the contract for furnishing the Government Printing Office with 13,800 pounds (300,000 sheets) of 28 x 34 yellow sulphite manifold paper at 8.48 cents. Whitaker Paper Company will furnish 15,500 pounds of 23 x 29 eight ply white cardboard at $33.92 per M sheets. Bids for both of these items were received on April 8.

R. P. Andrews Paper Company will furnish 6,240 pounds (40,000 sheets) of 38 x 48 lithograph finish map paper at 5.96 cents, bids for which were received on April 5.

Barton, Duer & Koch Paper Company will furnish 24,000 pounds (150,000 sheets) of 25 x 38 M.F. book paper at 5.25 cents, bids for which were received on April 1.

Whitaker Paper Company will furnish 200,000 pounds of M.F. book paper in 19 inch rolls at 4.34 cents, bids for which were received on March 29.

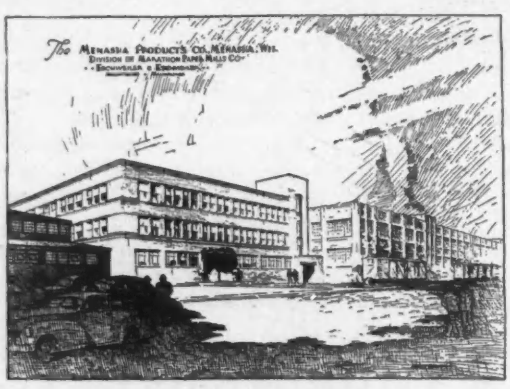
Printing Office has received the following bids for 40,000 pounds of No. 32 yellow sulphite writing paper; Whitaker Paper Company, 5.54 cents; Mudge Paper Company, 5.599 cents; R. P. Andrews Paper Company, 6.45 cents; Barton, Duer & Koch Paper Company, 5.57 cents; Old Dominion Paper Company, 5.144 cents; Paper Corp. of U.S., 6.4 cents; and Mathers-Lamm Paper Company, 5.64 cents.

For 36,000 pounds of 38 x 48 light weight M.F. book paper; Stanford Paper Company, 6.48 cents; R. P. Andrews Paper Company, 6.52 cents; Barton, Duer & Koch Paper Company, 6.52 cents; Mudge Paper Company, 6.5 cents; and Paper Corp. of U.S., 6.59 cents.

For 326,098 pounds of 34 x 44 inches white sulphite index paper; Whitaker Paper Company, 5.56 cents; R. P. Andrews Paper Company, 5.2 cents Walker, Goulard Plehn Company, 5.6 cents less 1 percent; Cauthorne Paper Company, 5.47 cents (for 182,320 pounds only); Barton, Duer & Koch Paper Company, 5.48 cents; Marquette Paper Company, 5.529 cents; Paper Corp. of U.S.. 5.42 cents; and Old Dominion Paper Company, 5.3188 cents.

Erect Office Building at Menasha

Construction of a new general office building and of an addition to the company's Menasha plant has been completed by the Menasha Products Company, Menasha, Wis., Division of Marathon Paper Mills Company, manufacturer and converter of paper and paper board for protective packaging. This is the most recent unit of the company's current building expansion program, and it follows a rebuilding and modernization of the company's pulp mill, paper and paper board plant at Rothschild, Wis.



PERSPECTIVE DRAWING OF NEW BUILDING. .

The new Menasha building makes available more than 70,000 additional square feet of factory space. The new manufacturing building consists of a basement and two floors, 220 x 110 feet. The basement floor is to be used for storage of raw materials. The entire first floor is utilized for carton production. Re-routing of production operations and installation of new printing and finishing equipment have been made on this floor. The second floor will be used for the manufacture of several Menasha specialty products and will also house the company's technical and research laboratories.

The new office building, a ground floor and three stories, is now occupied by the company's administrative and clerical personnel. Sales, engineering, production and accounting offices and the company's art department are located in the new structure. Both buildings are of reinforced concrete slab construction with brick facing and are completely air conditioned. The latter feature of the factory addition makes possible the most efficient handling of materials during production.

The Marathon Paper Mills Company, of which the Menasha Products Company is a division, operates paper mills and converting plants at Ashland, Wis., Rothschild, Wis., Wausau, Wis., and Menasha, Wis.

To Hold Election at Kalamazoo

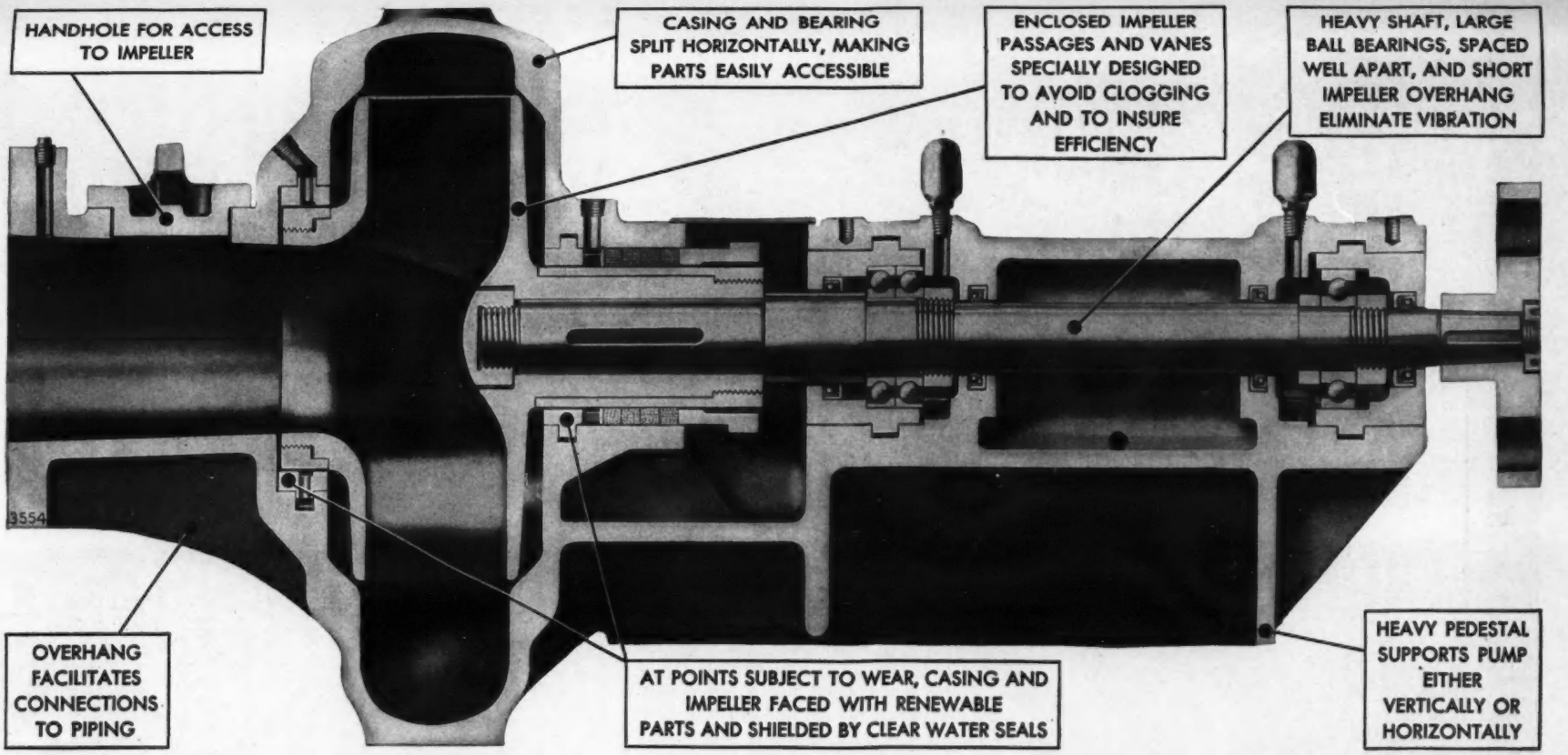
[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 1, 1940 — National Labor Relations Board has announced that a collective bargaining election would be held within 30 days among employees of Kalamazoo Paper Company, Kalamazoo, Mich., working in the company's two power houses, to determine whether or not they desire to be represented by Local 78, International Brotherhood of Firemen, Oilers, Helpers, Roundhouse and Railroad Shop Laborers, affiliated with the American Federation of Labor.

Included in the voting unit will be first and second firemen at Powerhouse No. 1 and firemen at Powerhouse No. 3, as well as the engineers, oilers, motor oiler, crane operators, boiler repairmen, and filter-plant operator. The chief and assistant chief engineers and the electricians will be excluded.

A representative of the union testified that 20 of the employees in the appropriate unit were members of that organization. However, the union did not seek certification upon the basis of evidence adduced at the hearing, but asked that an election be held.

The Board also announced certification of Independent Paper Workers' Organization, unaffiliated, as the sole collective bargaining agency designated and selected by a majority of the employees of Consolidated Paper Company, Aurora, Ill., following a collective bargaining election held March 28, resulting in a count of 70 votes for the unaffiliated union, 53 votes for Consolidated Paper Workers' Local Industrial Union No. 902, affiliated with the Congress of Industrial Organizations, and 6 for neither organization.


HANDHOLE FOR ACCESS TO IMPELLER
CASING AND BEARING SPLIT HORIZONTALLY, MAKING PARTS EASILY ACCESSIBLE
ENCLOSED IMPELLER PASSAGES AND VANES SPECIALLY DESIGNED TO AVOID CLOGGING AND TO INSURE EFFICIENCY
HEAVY SHAFT, LARGE BALL BEARINGS, SPACED WELL APART, AND SHORT IMPELLER OVERHANG ELIMINATE VIBRATION
3554
OVERHANG FACILITATES CONNECTIONS TO PIPING
AT POINTS SUBJECT TO WEAR, CASING AND IMPELLER FACED WITH RENEWABLE PARTS AND SHIELDED BY CLEAR WATER SEALS
HEAVY PEDESTAL SUPPORTS PUMP EITHER VERTICALLY OR HORIZONTALLY

The DE LAVAL CLOGLESS PUMP

Easy to live with

for paper stock, raw waste paper, rag stock, sewage, etc., has been carefully designed to develop high efficiency, while avoiding choking and wedging of solids. Renewable wearing parts provide for restoring original efficiency. Ask for Catalog P-3305.

DE LAVAL STEAM TURBINE COMPANY, TRENTON, N. J.

CONSTRUCTION NEWS

York, Pa.—The Schmidt & Ault Paper Company, King's Mill road, manufacturer of wrapping papers and kindred stocks, box board, etc., has approved plans for new addition to mill, to be two-story, designed primarily for storage and distributing service. Cost reported about $45,000, with equipment. Erection contract has been let to D. A. Smith, York, and work will be placed under way at once.

Stevens Point, Wis.—The Consolidated Water Power and Paper Company, Wisconsin Repaids, Wis., has completed plans for new addition to its Sevents Point branch mill, consisting of a three-story structure, 37x112 feet, to be used for storage and distribution. Company will carry out erection with day labor and expects to begin work early in May. Cost reported close to $60,000, with equipment. Thomas Utegaard is company enginer, in charge.

Middletown, Ohio—The Raymond Bag Company, Tytus avenue, manufacturer of paper bags and sacks, etc., has awarded general contract to F. H. McGraw & Company, First American Building, Middletown, for extensions and improvements in power house at local plant. Additional equipment will be installed; no estimate of cost has been announced. Work is scheduled to be placed under way at once.

Jackson, Miss.—The Great Southern Box Company, New Orleans, La., manufacturer of corrugated fiber boxes and containers, has work in progress on new branch plant on Fannin road, East Jackson, previously referred to in these columns, and will push erection to early completion. New plant will be one-story, about 70 x 250 feet, and will be equipped for large capacity. Superstructure work will be carried out by the E. B. Ludwig Construction Company, 1350 Jefferson highway, New Orleans. Entire project is reported to cost over $100,000, with equipment.

Chicago, Ill.—The United Paper Box Company, 727-39 North Kedzie avenue, manufacturer of stiff and other paper boxes and containers, has let general contract to M. Dugin & Son, 1312 South Harding avenue, for new two-story addition to plant, 96 x 125 feet, to be used primarily for storage and distribution. It is estimated to cost over $45,000, with equipment. A building permit has been issued and work will be placed under way at once. B. Albert Comm, 20 West Jackson boulevard, is architect.

Fort Worth, Tex.—The American Asphalt Roof Corporation, Fifteenth street and Blue River avenue, Kansas City, Mo., manufacturer of roofing paper stocks, prepared roofing materials, etc., has approved plans for new plant at Fort Worth, where tract of about 10 acres of land has been taken over on West Fifth street. It will comprise two main buildings, each one-story, 80 x 300 feet, and 42 x 250 feet, respectively. A boiler house and other mechanical units will be built for plant service. Cost is estimated in excess of $200,000, including equipment. General contract for erection has been let to Thomas S. Bryne, Fort Worth National Bank Building, and work is scheduled to be placed under way at once. At a later date company plans for the construction of several additional buildings on adjoining sites. Wyatt C. Hedrick, First National Building, Fort Worth, is architect. C. R. Sculley is company engineer in charge. F. J. McGinley, Jr., will supervise operations at the plant.

Lancaster, Pa.—The Armstrong Corp Company, manufacturer of insulating board, cork board and kindred products, has awarded general contract to Herman Wohlsens' Sons Company, Lancaster, for new addition to local mill, to be one and two-story, 65 x 550 feet, reported to cost over $150,000, including equipment. Erection will be placed under way at once.

Erie, Pa.—The Hammermill Paper Company, Lake Shore road, manufacturer of writing and other paper stocks, will proceed with erection of new addition to mill, for which general contract recently was let to the Henry Shenk Company, 1115 Sassafras street, Erie. It will be one-story, 120x140 feet, designed for storage and distributing service. Cost is reported in excess of $40,000, with equipment.

Mount Vernon, Ohio—The Shellmar Products Company, 224 South Michigan avenue, Chicago, Ill., manufacturer of cellophane products, has plans maturing for new addition to converting plant on West Madison street, Mount Vernon, previously referred to in these columns. It will be one-story, 100 x 225 feet, reported to cost in excess of $85,000, with equipment. It is expected to begin work this spring.

Detroit, Mich.—The Motschall Envelope Company has been incorporated with capital of $25,000, to manufacture envelopes and kindred paper products, and will take over and succeed to the company of same name, with local converting plant at 525 East Lafayette street. New company is headed by John M. Motschall, Grosse Pointe, Detroit.

Wausau, Wis.—The Minnesota Mining and Manufacturing Company, 791 Forest street, St. Paul, Minn., manufacturer of sand paper and other abrasive paper stocks, etc., has authorized plans for new addition to raw material plant at First and Rosencranz streets, Wausau, to be one-story, totaling about 10,000 square feet of floor space. It is reported to cost close to $40,000, with equipment. It is expected to ask bids on general erection contract in near future. Toltz, King & Day, Inc., Pioneer Building, St. Paul, is architect.

Albany, N. Y.—The Capital City Container Company, Inc., Thatcher street, manufacturer of corrugated paper boxes and containers, has plans under way for alterations and improvements in building on Tivoli street, to be used for storage and distributing service. No estimate of cost has been announced. Work is scheduled to begin soon.

Thorold, One.—The Ontario Paper Company, Ltd., manufacturer of newsprint, has approved plans for construction of a new boiler house at mill, to be about 43x53 feet, reported to cost close to $100.000, with boilers, pumps and other equipment. Award for erection has been made to Newman Brothers, Ltd., 127 St. Paul street, St. Catherines, Ont., and work will proceed immediately.

"EVERY PAPER PROBLEM IS A FELT PROBLEM"

America—*land of the* FREE—

MATCH!

AMERICA is the land of the free in more ways than one. It's the land of a free people, free speech, a free press and—*free matches.* Enough matches are now given away in the United States each year to light 120 *billion* cigarettes.

What made it possible? The development of a paper match strong enough to be struck without breaking—and the widespread use of the match pack as an advertising medium.

Making a good paper match was a paper problem—and a felt problem. Match board must pass exacting tests of strength, rigidity and burning qualities. Felts to make it must be open enough to permit high speed production, strong and durable enough for long-run economy, and must at the same time impart a proper finish.

F. C. Huyck & Sons are proud of the part they played in solving these problems, proud that Huyck felts are now used in making so large a portion of America's paper matches. Huyck's 70 years of experience in felt making can help *you* solve *your* felt problems. Through our representative in your territory and our field engineers, this experience and all our research facilities are available to you for the asking.

KENWOOD WOOL PRODUCTS

F. C. HUYCK & SONS

ESTABLISHED 1870

KENWOOD FELTS · ALBANY, N. Y.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for the Week Ending May 1, 1940

	High	Low	Last
A.P.W.	3⅝	3⅝	3⅝
Armstrong Cork Co.	42¼	40¾	41⅛
Celotex Corp.	10¾	10¼	10½
Celotex Corp., pf.	76	69	72
Certain-Teed Products Corp.	7	6½	6⅝
Certain-Teed Products Corp., pf.	33½	30¼	30¼
Champion Paper & Fibre Co.	28¾	27½	27½
Champion Paper & Fibre Co., pf.	105¼	105¼	105¼
Congoleum-Nairn Co.	22⅜	21⅞	21⅞
Container Corp. of America	19¼	18	18
Continental-Diamond Fibre Co.	9¼	8⅝	8⅝
Crown-Zellerbach Co.	19⅝	18⅜	19
Crown-Zellerbach Co., pf.	94⅞	92¾	94⅛
Flintkote Co.	19⅛	18⅛	18⅛
Robert Gair	5⅛	4¾	4¾
Robert Gair, pf.	20	18	19
International Paper & Power	20¾	18¾	19⅜
International Paper & Power, pf.	73	68½	70¾
Johns-Manville Corp.	71¾	69¼	69⅜
Kimberly Clark Corp.	45	43¼	44
MacAndrews & Forbes	33½	32½	32½
Masonite Corp.	32⅜	32½	32½
Mead Corp.	13¾	12⅜	13¼
Mead Corp., pf.	73	71	73
Paraffine Companies, Inc.	42⅛	41½	41½
Paraffine Companies, Inc., pf.	101½	101	101
Rayonier, Inc.	27⅛	24⅛	26½
Rayonier, Inc., pf.	35¾	33½	35¼
Ruberoid Co.	19⅜	19⅛	19¼
Scott Paper Co.	43¾	43	43
Scott Paper Co., pf.	10[illegible]	107¾	107⅞
Sutherland Paper Co.	30	28⅞	28⅞
Union Bag & Paper Corp.	18⅛	17⅛	17⅛
United Paperboard Co.	6¼	6	6
U. S. Gypsum Co.	83¼	80	83¾
U. S. Gypsum Co., pf.	178	178	178

New York Curb Exchange

High, Low and Last for the Week Ending May 1, 1940

	High	Low	Last
American Box Board Co.	7½	7⅛	7⅛
Brown Co., pf.	32	29¾	29¾
Great Northern Paper	49¾	48⅜	49¾
National Container Corp.	13¾	12⅞	13
St. Regis Paper Co.	4¼	4	4⅛
St. Regis Paper Co., pf.	80¾	77	77
Taggart Corp.	5⅛	5¼	5⅜

A. W. P. Co. Earns $9,879

The American Writing Paper Corporation for the March quarter reports a net profit, subject to audit, of $9,879 after setting aside $29,639 to provide for interest on general mortgage bonds. This compares with net profit last year of $26,321 after $78,962 for interest on these bonds. Under terms of indenture of general mortgage bonds, it is provided that until December 31, 1940, after which period rate of 6 per cent will become fixed, 75 per cent of available income be applied toward interest on these bonds to a maximum of 6 per cent thereon. The sum accrued thus far for interest on these bonds is subject to additions or deductions dependent upon results of operations for the balance of the year.

Paraffine Companies Net $361,874

The Paraffine Companies, Inc. and subsidiaries for the March quarter report a net profit of $361,874, equal after dividend requirements on 4 per cent cumulative convertible preferred stocks to 71 cents each on 476,-062 shares of common stock, compared with $473,655, or 95 cents a common share, in preceding quarter and $336,398, or 66 cents a common share, in March quarter a year ago. Nine months to March 31: Net profit, $1,417,501, or $2.62 a common share, against $1,037,061, or $2.03 a share on common, for same period of previous year.

Robert Gair Earns $203,598

Robert Gair Company, Inc., and United States subsidiaries report for the quarter ended March 31, 1940, a profit, after depreciation, interest and dividends of subsidiary company, and reserve for federal income tax but before interest on income notes, of $203,-598.09.

Gair Company Canada Limited, wholly owned subsidiary of Robert Gair Company, Inc., reports for the Quarter ended March 31, 1940, profit, after $44,-500 reserve for Dominion income tax, of $71,807.27 in Canadian dollars.

Due to the discount on exchange of Canadian dollars into United States currency, issue of a consolidated statement of earnings is impracticable and no comparison with the corresponding period of the previous year is available.

Fraser Companies Net $96,896

MONTREAL, Que., April 29, 1940—A financial statement issued on behalf of Fraser Companies, Limited, and subsidiaries for the quarter ending March 31, 1940, shows a substantial improvement over a year ago. At $575,796 earnings for the period, before depreciation and depletion, covered aggregate interest charges more than 2½ times, and after depreciation and depletion covered aggregate interest charges more than 1.4 times. A year ago earnings, subject to depreciation and depletion, fell short of covering aggregate interest charges by some $4,000.

After all charges, including interest, depreciation and depletion, but before provision for income taxes, and subject to year-end adjustment on audit, net profit for the period was $96,896 against a net loss a year ago of $263,003.

B. C. Pulp & Paper Reports $435,055

VANCOUVER, B. C., April 20, 1940.—Lawrence Killiam was re-elected as president of British Columbia Pulp and Paper Company at its annual meeting held at Vancouver, B. C., recently. All officers and directors of the company were re-elected as follows:

George Kidd, vice-president; O. A. Jorgenson, treasurer; Ethel M. Dominy, secretary; directors, W. H. Malkin, R. G. Buchanan, Cecil Killam and I. W. Killam.

Operating profit of $435,055, contrasted with a loss of $42,944, was reported by Mr. Killam, who said that the company's two mills were now working full time with orders exceeding production.

Scott Paper Nets $442,382

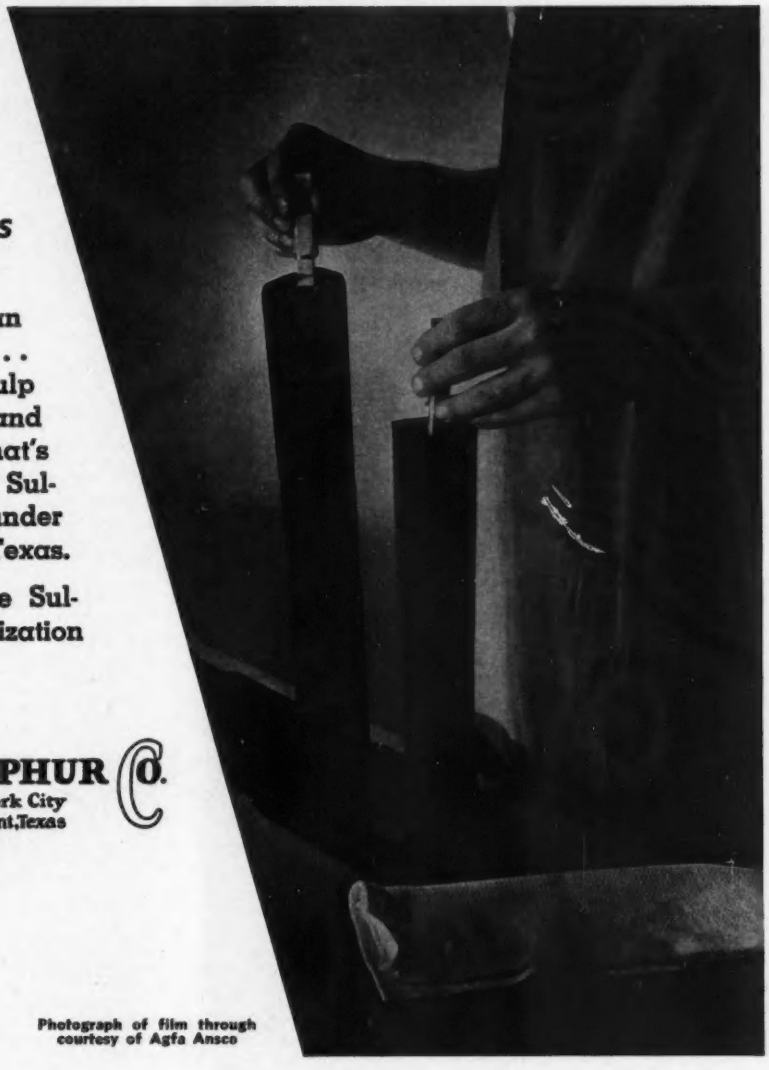
The Scott Paper Company for the quarter ended March 31, reports a net profit of $442,382 after taxes and charges, equal after preferred dividend requirements, to 56 cents a share on 667,941 outstanding common shares, as compared with $322,734 for the first quarter of 1939, equal to 43 cents a share; net sales for first quarter of this year $5,260,281, against $4,161,118 for the same quarter in 1939.

SULPHUR and its Destiny

. . . . through the Pulp Industry to Photographic Films

Sulphur, the purest that can be obtained commercially . . . then "acid" and sulphite pulp . . . finally cellulose, films, and fun for millions of people. That's one of the destinies of the Sulphur that lies buried deep under the domes of Southeastern Texas.

The pulp industry, like the Sulphur industry, serves civilization in more ways than one.



Photograph of film through courtesy of Agfa Ansco

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75 E. 45th Street New York City
Mines: Newgulf and Long Point, Texas

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 110 May 2, 1940 No. 18

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Olympic Hotel, Seattle, Wash., August 20-23.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Convention, Netherland Plaza Hotel, Cincinnati, Ohio. June 18-20.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Stevens Hotel, Chicago, Ill. October 7-11.

GOVERNMENT AND BUSINESS

Under the present stimulation of business created by the conflict in Europe, of which the economic significance is perhaps of more importance to this country than are its political aspects, general business activity has been rising. The largest industrial and neutral country in the world must, of course, temporarily profit by these advantages without much solicitation on its part and could not fail to receive heavy orders for its varied products unless its markets were closed to all belligerent nations. But hostilities on the modern plan are too destructive to men and materials to continue long and when peace comes to the exhausted nations, the stress and strain of the long period or readjustment which must follow as the aftermath of conflict, is a depression that spreads over the entire world. Many of the important problems created by the last world conflict remain unsolved.

The present conflict will, if we accept good authority, increase the complexities of international trade and relations and add many more problems for the future to consider. The trend of this Administration is toward a more active participation in the present conflict, the first step of which is entirely economic. This is not to say the military power of the United States will become involved, but the United States is already supplying the materials of war at a good profit and current business is at a higher level of activity because of the wider export market for domestic goods, together with the great decline in the competition of foreign industry.

Thus, we are informed by good authority, that the conflict in Europe maintains business volume at a higher level than it would be otherwise. Good authority also supplies the information that domestic industry and trade should be much higher than it has attained today. It would be, good authority states, but for the restrictions imposed upon the free flow of private funds into productive uses. Among the thirty new government agencies set up by the New Deal, the decisions of which are, in most cases, not subject to judicial review, the Securities and Exchange Commission is one of the most vital to business expansion. The hostility shown by the New Deal to business has also created other legislation that retards the full normal expansion of all vigorous private business enterprises.

A new concept of government in opposition to the American plan in the past, has been conceived or adopted from European economic and social theories. In addressing the members of the American Newspaper Publishers Association in New York recently, Wendell L. Willkie, president of the Commonwealth and Southern Corporation, stated in part: "To the liberal, the purpose of government is unchangeable. It is to leave men free. And the liberal does not see in the present administration any will to leave men free. He sees only an attempt to increase the powers of government. The present huge Federal organization with its payroll of over 1,000,000 employees, its dozens of agencies and commissions, its expenses of several billion dollars a year, represents an entirely new concept of government. It is government regarded not as a supplementary influence, but as a dominant force in the lives of the people.

"This hostility toward domestic business is the more extraordinary in view of the government's friendly attitude toward foreign trade. Without entering here into technical arguments as to methods by which they are brought about, international trade agreements which lead to further interchange of goods between nations and the establishment of an international monetary standard are indispensable to our complete recovery and future economy . . . The activities of the present administration have drained the vitality and confidence from American industry. It is ironic that in view of these conditions the government should turn upon industry and denounce it for its failure to recover and make wild charges concerning 'a strike' of capital. Industry is being criticized for being unable to do what government prevents it from doing."

Responsibility for the prolonged inactivity in the capital market that has virtually stopped the flow of investment funds into industry was placed directly upon the Federal authorities and the regulating agencies, in the statement sent by E. F. Connely, president of the Investment Bankers Association of America to Jerome N. Frank, chairman of the Securities and Exchange Commission. The letter of the association,

which has 740 members, states in part: "We are fully in accord with the view of President Roosevelt that there are in this country today no more urgent questions than those which are concerned with the energetic stimulation of the flow of savings into investment which will bring together idle men, machines, and money and make possible a rising standard of living for all.

"We therefore, most strongly urge that your commission, pursuant to its statutory duty, immediately recommend to Congress that the laws administered by the commission be reviewed and amended so as to remove deterrents unnecessary for the protection of investors or the public, which now impede the operation of our economy . . . It is a matter of the highest importance in the public interest that questions which gravely affect the operation of our system of free enterprise should be aired in the full light of day. The evidence for and against every important question of policy, concerning the regulation of business and the administration of the laws relating thereto, should be heard and considered by impartial tribunals."

To Tender Dinner to Jacob Sincoff

Jacob Sincoff will be honored at a testimonial dinner tendered by the Paper, Paper Box and Allied Trades Division of the United Jewish Appeal it is announced by Abraham Herman and Abraham Mazer, co-chairmen of the Dinner Committee.

The affair, which will be held on Tuesday evening, May 28, at the Hotel Plaza, will recognize the business and philanthropic achievements of Mr. Sincoff and will launch officially the industry's efforts in behalf of the 1940 United Jewish Appeal campaign for refugees and overseas needs. More than 500 leading representatives of all branches of the paper industry are expected to attend the dinner to Mr. Sincoff.

Enthusiastic cooperation of the leading manufacturers of the industry has been secured, assuring success for the affair and indicating the high regard with which the guest of honor is held, the co-chairmen declared.

Mr. Sincoff is chairman of the Division's Committee on Appeal. S. T. Baron, Morris Gintzler and William Salzman are co-chairmen. Isaac Gilman and Dr. Israel Goldstein are honorary chairmen of the Dinner Committee.

Vice-chairmen include: Samuel Kipnis, Benjamin Kushel, Louis Rosenfeld and Joseph H. Simon. Milton Collier is treasurer. The following are associate chairmen: Dan Bellin, William Conescu, Sam Fishman, Jacob S. Glekel, Morris Heller, David Kasson, Joseph M. Mazer, William Mazer, Benjamin Mintz, H. Pollack, Charles H. Schaffer, Ben Sheldon, Michael Sincoff, and Jack Weill.

Paper Stock Prices May Advance

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., April 29, 1940—According to general opinion, prices of paper stock will advance due to lack of, or at least much less, material from abroad, but practically no change has taken place yet, it is stated, on account of poor business.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1940	1939	1938	1937	1936	1935	1934
January	90.6%	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	86.3%	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	84.0%	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	.....	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	.....	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	.....	79.7%	66.5%	87.3%	80.7%	72.3%	.....
July	.....	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	.....	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	.....	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	84.9%	72.3%	80.6%	81.3%	70.5%	.....
First 16 weeks	86.8%	81.5%	67.5%	90.6%	77.9%	68.8%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1940		CORRESPONDING WEEKS, 1939	
March 16	84.7%		
March 23	85.1%	March 18	82.3%
March 30	82.7%	March 25	84.1%
April 6	81.9%	April 1	86.2%
April 13	83.4%	April 8	83.7%
*April 20	88.8%	April 15	81.0%
		April 22	82.7%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	Mar. 16, 1940	Mar. 23, 1940	Mar. 30, 1940	Apr. 6, 1940	Apr. 13, 1940	Apr. 20, 1940
0% to 50%	59	53	49	61	58	45
51% to 100%	240	242	245	226	223	193
Total Mills Reporting	299	295	294	287	281	238

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	....	....	....	....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	....	....	....	....	....	....

Week end. Mar. 16, 1940—70%
Week end. Mar. 23, 1940—70%
Week end. Mar. 30, 1940—67%
Week end. Apr. 6, 1940—68%
Week end. Apr. 13, 1940—66%
Week end. Apr. 20, 1940—72%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

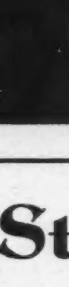
* Preliminary figure.

Request Not to Cut Seed Trees

One of the forest practice rules of the Southern Pulpwood Conservation Association calls for the leaving of seed trees to regenerate areas from which the pulpwood has been cut. It has been experienced that in many instances these seed trees have either been cut by the landowner himself, or else the landowner has sold these trees to some other wood using industry. It is hoped that the use of seed tree tags which read, "Seed Tree, left to reforest this land for future income. Please do not cut. Southern Pulpwood Association.", will discourage the cutting of all trees left for reforestation purposes. The Association feels further that the use of these tags will do much to make pulpwood producers, landowners, and also other wood using industries much more forestry conscious. As a start member mills are experimenting with 800 thousand of these tags distributed throughout the eleven Southern states where pulpwood is being cut.

They Started Something!

THE man who first linked two great continents by a slender cable on the ocean's bed revolutionized the course of commerce and industry. Communication between America and Europe became a matter of minutes instead of days when the Transatlantic cable was successfully completed. With easier communication came the opening of new markets for the products of industry —more accurate knowledge of world-wide conditions—greater facility in the transaction of business. The perseverance of Cyrus W. Field and his associates in the face of repeated disappointments, of almost insurmountable obstacles, gave a new impetus to the development of commerce—an impetus that stimulated the growth of almost every phase of business activity. When the first telegraph message crossed the ocean, a new era began in industry.



The first cylinder of Liquid Chlorine made by EBG in 1909.

EBG engineers, too, started a new era in more than one industry when they first made Liquid Chlorine commercially available in America. Manufacturers of paper and textiles were enabled to set new standards of quality—for Liquid Chlorine made possible more efficient and more economical bleaching methods. And another revolution took place in standards of public health—for EBG Liquid Chlorine has helped to prevent the spread of disease by bringing pure, safe water supplies to hundreds of communities and playing a vital role in the sterilization of sewage.

Pioneers in the production of Liquid Chlorine, EBG engineers have the advantage of long experience in its manufacture and servicing. Let this experience work for you—use EBG Liquid Chlorine.

ELECTRO BLEACHING GAS COMPANY
Main Office: 60 East 42nd Street, New York, N. Y.
Plant: Niagara Falls, N. Y.

EBG Liquid Chlorine

FIRST IN THE COUNTRY

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Water Vapor Permeability*

Progress Report of the TAPPI Subcommittee on Water Vapor Permeability

By G. J. Brabender,[1] Chairman

Abstract

The work of the Water Vapor Permeability subcommittee of the Paper Testing Committee of the Technical Association of the Pulp and Paper Industry for 1939 is discussed. A method for determining water vapor permeability is suggested and submitted with this report.

The work of the subcommittee on the determination of water vapor permeability of papers, paperboards, and other sheet materials has been devoted largely to the formulation of a testing procedure to be proposed as a TAPPI suggested standard. The comments which followed the reading of the author's paper on this subject *(1)* at the February 1939 meeting of the Technical Association of the Pulp and Paper Industry were of much value in drawing up the proposed method. Further assistance was rendered by subcommittee members in submitting suggestions and comments regarding the proposed method. The chairman of this committee is particularly indebted to F. T. Carson for his work in proofreading the original draft of the method and for suggestions and criticisms used in improving both the technique and the mechanics of the procedure.

Copies of the proposed method were submitted to all members of the subcommittee on water vapor permeability as well as to others who have been particularly interested in this subject.

Discussion of Comments on Proposed Method

The comments submitted by those to whom copies of the proposed method were sent may be divided into three principal groups: namely, (a) those which affect the results obtained because of factors pertaining to the method of sealing, (b) the materials and equipment used, and (c) the atmospheric conditions employed in carrying out the test.

Oxidation of the rosin used in the sealing composition has given rise to the question of possible weight change during the test due to such chemical action *(3)*. The adsorption of water by the sealing medium with consequent increase in weight has also been mentioned as a source of error *(4)*. The use of a tare weight made up in exactly the same manner as the actual test assembly but replacing the test sheet by a sheet of shim metal should cancel such errors, where results of the highest precision are sought. Moreover, carefully conducted tests on the weight increase due to these two factors indicate that the combined error resulting from such effects would be equivalent to somewhat less than 0.1 g. per sq. m. per 24 hr. in water vapor permeability. This value approaches the precision of the method itself. These tests were made by assembling a test cell similar to that shown in Fig. 6 in the testing procedure and using a sheet of shim brass as the test sheet. A regular water vapor permeability test was then carried out according to the procedure for the desiccant method. Weighings were made at regular intervals over a period of one week using an all metal, hermetically sealed tare weight.

Adsorption of water by the wax will undoubtedly occur during the first few hours of the test period, when equilibrium is being established. Permeability values calculated from the straight line portion of the time-weight change curve should eliminate any errors due to such moisture adsorption effects.

Objections have been raised to both the cost and the difficulty of regeneration of the desiccant, anhydrous magnesium perchlorate, which has been recommended for use in this test *(4)*. Both of these objections must be considered. On the other hand, there does not seem to be any other desiccant which has all of the qualities combined in this material. For example, the overall efficiency of magnesium perchlorate as defined under *apparatus* is much better than other commonly used drying agents.

Experience has shown that anywhere from 50 to 100 tests can be made with a pound of desiccant selling at $3.20 when working with sheet materials of relatively low permeability, thus allowing reuse of the desiccant. Larger quantities of desiccant may be purchased at a substantially lower cost. The spent desiccant may be regenerated by the use of a high vacuum pump, a small corrosion-resistant vacuum metal desiccator and a drying oven capable of maintaining a temperature of 250 deg. C. *(2)*. Where many tests are being made, the cost of equipment for regeneration will soon pay for itself.

Difficulties, because of corrosion of metal cups, especially those made of aluminum, have been men-

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 19-22, 1940.

[1] Member TAPPI, Chemical Engineer, Technical Department, Marathon Paper Mills Co., Rothschild, Wis.

tioned. Experience has shown that the use of distilled water in cups made of high grade aluminum reduces such difficulties to a minimum. Only in those cases, where the aluminum stock is contaminated with traces of impurities, do serious corrosion difficulties occur. The use of anodized aluminum cups has given satisfactory results also *(6)*.

The determination of water vapor permeability of various sheet materials (particularly those of noncellulosic origin used in the electrical industry) has been made with a test assembly in which liquid water is in actual contact with the membrane material *(6)*. Results obtained in this manner have undoubtedly furnished valuable information to investigators in such specialized fields. Moreover, a testing procedure becomes more valuable as the conditions employed during the test more nearly approach the use conditions of the material being tested.

On the other hand, there is much evidence to show that liquid water in contact with a sheet surface, especially one of cellulosic material, introduces effects which are normally absent when water in the vapor state is in contact with the sheet. These effects due to liquid water may result in marked physical changes in the sheet material. Consequently, permeability values may bear no relation whatever to those obtained, when water in the form of vapor is in contact with the sheet, or the data obtained may be interpreted erroneously.

The humidity conditions employed by many investigators have varied considerably even within the field covered by the paper industry alone. For example, while many laboratories have adopted the standard conditions of 21 deg. C. and 65 per cent r.h. for the constant temperature and humidity rooms in which they conduct their work on papers, others have employed a relative humidity of 50 per cent, and some in the paperboard industry have used 45 per cent. These constant temperature-humidity rooms are commonly used for conducting tests on water vapor permeability thus giving rise to much confusion in the correlation of results from different laboratories. Moreover, to change the atmospheric conditions in such testing rooms usually results in considerable inconvenience, especially if other paper tests are being made in the room at the same time.

There remains the problem of determining the effect of the particular humidity range chosen on the water vapor permeability results. The rate of permeability of water vapor through membrane materials has sometimes been assumed to follow Fick's law of diffusion, which states that the diffusion rate is directly proportional to the first power of the vapor pressure difference. There has been increasing evidence to show that the rate of permeability of water vapor increases as the difference between absolute humidities becomes greater. There is further evidence to show that the rate of increase is not related linearly to absolute humidity difference, but the relation between the variables is quite likely to be different for various types of sheet materials. The moisture equilibrium curve for various materials undoubtedly plays a significant role in the relationship existing between permeability and relative humidity range.

Several instances have come to the attention of this committee *(5)*, where investigators have encountered difficulties in attempting to correlate results obtained from tests conducted over various humidity ranges. Some of these workers have started testing programs which should throw considerable light on the laws governing diffusion of water vapor through sheet materials. However, there is an urgent need for more information in this field. Members of this committee feel that TAPPI could render valuable service in sponsoring a research project designed to remove much of the confusion now existing in the interpretation of water vapor permeability measurements. The equipment and time required to conduct such an investigation is more than that which could be expected from an individual concern. Moreover, the results obtained would be of much benefit to the paper industry in particular and to other industries as well.

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(1) Brabender, G. J., *Paper Trade J.* 108, no. 4:39 (Jan. 26, 1939).
(2) Dehydration Studies Using Anhydrous Magnesium Perchlorate, G. Frederick Smith Chemical Co., 867 McKinley Ave., Columbus, Ohio.
(3) Private communication.
(4) Private communication.
(5) Private communication.
(6) Taylor, R. L., Hermann, D. B., and Kemp, A. R. *Ind. Eng. Chem.* 28, no. 11, 1255.

APPENDIX

Proposed TAPPI Method for Determining the Water Vapor Permeability of Paper and Paperboard

SCOPE

This method is proposed for the determination of the water vapor permeability of paper and paperboards. It is considered suitable also for other sheet materials.

There may be considerable difference in the permeability of a sheet when the two faces are exposed respectively to (a) a high humidity on the one face of the sheet and a medium humidity on the other and (b) a medium humidity on the one face of the sheet and a low humidity on the other. Hence, the method involves measurement under one or both of these conditions. Where special use requirements are involved, such as with other temperatures or humidity differences, the test conditions may be varied accordingly. In all cases the testing conditions shall be stated fully in the report.

APPARATUS

1. An open mouthed cup or dish of such size and shape that it can be accommodated readily on the pan of an analytical balance. The area of the opening should be as large as practical, an area of at least 30 sq. cm. being preferred.

The test dish must be of such design that a satisfactory seal can be made to prevent leakage of water vapor at or through the edges of the sheet and to define clearly the test area. Suitable designs for the dish with supporting rings and flanges are shown in Figs. 1 to 9, inclusive. Other modifications of these designs may be made, without departing from the principle of preventing edge leakage by means of a complete wax seal.

2. A templet for use in defining the test area and effecting the wax seal consisting of a circular metal disk ⅛ in. thick, made from brass, aluminum, or other suitable metal and having the edge bevelled to an angle of about 45 deg. The smaller diameter of the templet must not be greater than the smallest diameter of the cell in contact with the specimen.

3. A desiccant with a puissant affinity for water

vapor and a high drying efficiency, i.e., a low vapor pressure after absorbing a large amount of water. The desiccant must remain essentially unchanged in physical condition and exert, while dry, no chemical or physical action on membrane materials with which it is in contact, other than dehydration effects. Anhydrous magnesium perchlorate made by the G. Frederick Smith Co., Columbus, Ohio, has been found satisfactory.

4. Wax for sealing the specimen to the testing dish made up of equal parts of crude beeswax and rosin. This wax clings tenaciously to surfaces and is not brittle at ordinary room temperature.

5. Petrolatum for application to the bevelled edge of the templet in order to facilitate removal of the templet after sealing the test sheet to the dish. The petroleum jelly commonly used by druggists is suitable.

6. An analytical balance of 200-g. capacity and sensitive to 0.001 gram.

7. A closed dish used as a tare to minimize the effect on successive weighings of the changing buoyancy of the air, resulting from variations in atmospheric pressure during the test period. This tare should weigh about 10 g. less than the assembled test dish and confine approximately the same volume of air.

8. A testing room or cabinet provided with conditioned air, maintained at 21 (± 0.5) deg. C. and 65 (± 2) per cent r.h. and continuously circulated at a rate not less than 500 f.p.m. over the exposed faces of the specimens under test.

9. A suitable grill or reticulated rack in the testing room or cabinet, capable of supporting the inverted specimens in a manner to afford free access of the circulating air.

Test Specimens

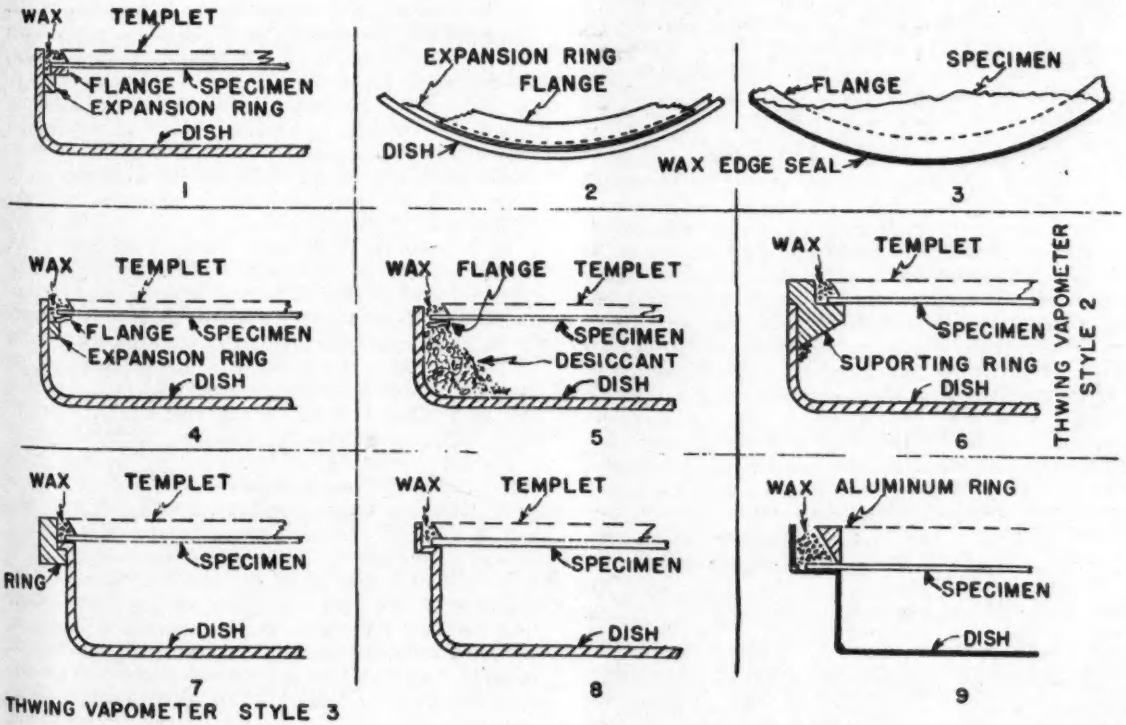
The test specimens shall be representative of the material, and shall be attached to the dishes in such manner as to provide for at least two tests from each side of the material.

Procedure

Desiccant Method: Place sufficient dessicant inside the dish to cover the sheet area to a depth of at least 15 mm. Cut the test specimen so that its diameter is equal to that of the larger diameter of the templet. Place the sheet over the aperture of the dish and center it as closely as possible on the supporting ring or flange. With the tip of the finger apply a thin film of petrolatum to the bevelled edge of the templet. Wipe off any petrolatum which may have been deposited on the smaller surface of the templet. Center the templet with the smaller surface down, exactly over the specimen and dish opening. Flow molten wax into the annular space surrounding the bevelled edge of the templet, using a dropper to dispense the molten wax. Remove the templet from the sheet surface as soon as the wax has cooled and solidified.

Weigh the assembly on the analytical balance to 0.001 g. using the tare. Place the dish on the rack inside the room or cabinet in an inverted position, so that the layer of desiccant is in direct contact and evenly distributed over the inner face of the test sheet, and so that free access of the conditioned circulating air is provided on the exposed surface of the sheet.

Make successive weighings of the assembly at suitable intervals, usually of several hours, until a constant rate of gain is attained. Plot the weight gain against time. The slope of the resulting curve will furnish a measure of the water vapor permeability.



Figs. 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Water Method: The use of water inside the dish requires that the test be carried out with the dish in the upright position. As a result there will exist a layer of air between the water surface and the under surface of the test sheet, through which water vapor will diffuse at a rate that cannot be measured conveniently. Moreover, any flange or ring projecting from the wall of the disk will influence the direction of the diffusion of the water vapor. The ratio of water surface area to test sheet area will also have an influence on the water vapor pressure existing beneath the sheet surface especially for materials having high permeability. This ratio should be standardized at 1:1 according to requirements in (1) below.

The procedure for making a test by the water method is exactly as described for the desiccant method except that:

1. The dish is of the type shown in Figs. 7, 8 and 9, with an inside diameter of at least 60 mm.

2. Place sufficient distilled water in the dish to bring the level of the water to such a height that the distance between the water surface and the under surface of the sheet is 25 mm. A depth of 5 mm. of water will adequately take care of losses by evaporation through the most permeable sheets.

3. The dish is placed in the upright position within the testing room or cabinet.

REPORT

The water vapor permeability shall be reported as grams per square meter per 24 hr. at 21 deg. C. and for a moisture gradient defined by the desiccant method or the water method of the preceding section. The report must state clearly which method was used. The calculation should be made for the period of constant rate of gain or loss.[2] The permeability values shall be reported for each side of the sheet separately, the side designated in each case being that which faced the higher humidity in the test. A suitable code designation should be used to distinguish between the two sides of the material, such as Side I and Side II; or when there is an obvious difference between the two sides, such as Side I, waxed and Side II, unwaxed.

PRECISION

Duplicate determinations should give checks within ± 10 per cent, depending largely on the variation in the sheet material itself. The spread between very permeable sheets and those having a low permeability is at least a thousand fold. Therefore, a precision of ± 10 per cent on a given material will establish it quite definitely in the scale of permeabilities normally encountered in sheet materials.

Additional Information

(1) Abrams, Allen and Chilson, W. A. *Paper Trade J.* 91, no. 18:185 (Oct. 30, 1930).
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(3) Brabender, G. J. *Paper Trade J.* 108, no. 4:39 (Jan. 26, 1939); *Tech. Assoc. Papers*, 22; 95, 251 (1939).
(4) Carson, F. T. National Bureau of Standards *Misc. Publication* M127 (Aug. 5, 1937).
(5) Carson, F. T. *Paper Trade J.* 107, no. 18:59-61 (Nov. 3, 1938).
(6) *Tech. Assoc. Papers* 20:90-102 (1937).

[2] If, e.g., in a test run for 190 hr. by the desiccant method on an exposed area of 55 sq. cm. (0.0055 m²), it was found that the rate of gain was substantially constant after 18 hr., and that during the subsequent 172 hr. the moisture absorbed by the desiccant was 67 mg. the water vapor permeability is then (0.067 x 24)/(0.0055 x 172) = 1.70 g. of moisture passing through 1 sq. m. of the material every 24 hr. at 21 deg. C. from 65 per cent r. h. on one face, to desiccant in contact with the other.

New England TAPPI at Wrentham

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Weber Duck Inn, Wrentham, Mass., on Friday, April 26, 1940. R. H. Doughty of the Fitchburg Paper Company presided as chairman. During the afternoon, guided tours were made of the plants of Bird & Son, the Foxboro Company, and the Bird Machine Company.

Following an excellent dinner at the Weber Duck Inn, Roger Egan of Bulkley, Dunton & Co., showed motion pictures depicting details of the 1934 TAPPI meeting and tour of Portland, Ore. Following this he gave interesting details concerning the 1940 fall meeting to be held at Seattle, Wash. from August 20-23.

The principal speaker was V. S. Denison of the Beloit Iron Works who showed a large number of pictures of cylinder machine details and commented on the new developments featuring the machine.

More than 125 were present, one of the largest attended meetings of the New England TAPPI. Among those present were: Norman Alper, A. M. Altieri, W. H. Anderson, A. F. Bailey, A. C. Bate, J. C. Barthel, Alfred Berndt, Mr. and Mrs. P. S. Bolton, A. W. Brigham, J. W. Barke, H. K. Burrill, P. J. Byrnes, Jr., Arthur Cardinal, Mr. and Mrs. Carroll, Ralph F. Carter, R. Carter, J. T. Cassaday, J. Carey, R. F. Charles, R. C. Charron, C. H. Child, James Christopher, R. J. Clapp, Eugene Connolly, Mr. and Mrs. A. F. Cosley, Edward T. Costello, J. F. Cronin, Ralph J. Dalton, C. W. Damon, Earle C. Davis, V. S. Denison, Mr. and Mrs. R. H. Doughty, G. S. Douglas, C. I. Duston, Roger Egan, H. I. Chrisman, Frank R. Filz, A. F. Fisk, T. J. Flaherty, W. L. Foote, A. F. Gilmore, Philip Goldstern, E. R. Granger, R. W. Hamilton, J. Hankard, W. J. Hartman, M. J. Hathaway, P. B. Holden, Walter Holzer, H. J. Hosking, C. I. Horton, H. G. Ingraham, M. Jacobs, Dr. W. Kaufmann, J. P. Kennedy, R. E. Kilty, R. H. Kimball, C. P. Kirchen, Paul Knight, W. A. Knofler, W. O. Koehler, A. C. Lamareux, Ray Lavin, J. F. Leahy, R. M. Leighton, F. H. Lovenberg, J. R. Lyon, R. G. Macdonald, James Maginnis, G. E. Mangsen, Robert Mannheim, R. B. Marshall, W. C. Marshall, F. Massey, R. C. Marvin, B. J. Mayo, Jr., C. S. Maxwell, Michael McDonagh, Louise E. McGrath, O. W. Messner, J. K. Morris, C. V. Moxley, P. H. Mudgelt, A. W. Neubauer, W. A. Niviling, F. W. Nyborn, J. J. O'Brien, H. L. O'Neil, Frank O'Rourke, R. J. Proctor, H. D. Pugsley, A. E. Regnier, H. W. Richter, H. W. Schwartz, Russell Shaw, Amos Sheperdson, C. W. Slowman, J. E. Smith, J. P. Stephens, F. A. Strovink, P. Sinclair, Roy Tewksbury, H. L. Thompson, S. E. Thompson, A. K. Warner, B. D. Warren, R. A. Wilkins, Morton Woodorson, Rufus Worrell, J. F. Wright and G. R. Wyman.

Rolland D. Smith Goes to New Orleans

Rolland D. Smith, associated with the paper mill department of Stein-Hall Manufacturing Company, Chicago, for the past four years, has been appointed New Orleans branch manager, succeeding Hugh J. McKane, who was killed in an automobile accident in January. Mr. Smith is a graduate of the engineering department of the University of Michigan and spent several years with the French Paper Company of Niles, Mich., before joining Stein-Hall.

Methocel—Properties and Suggested Uses In the Paper Industry*

By R. M. Upright[1] and F. C. Peterson[1]

Abstract

Methocel[2], the water soluble methylcellulose of domestic manufacture, is a white fibrous solid which dissolves in cold water to give odorless, colorless, and nontoxic solutions. It is insoluble in hot water and organic solvents and unaffected by oily or greasy materials of animal, vegetable, or mineral origin. Aqueous solutions are neutral and resistant to alkali and dilute acids.

When cold solutions are heated their viscosity decreases rapidly. Eventually a temperature is reached at which an increase in viscosity occurs, and within a few degrees the solution is transformed to a firm gel.

Aqueous solutions of Methocel can be blended with those of starch, glue, casein, latex, dextrins, and water dispersible gums. Plasticizers may be added if necessary, those suggested being polyhydroxy compounds such as glycol, diethylene glycol, glycerine, sorbitol, and invert sugar. Films deposited from solution onto paper are strongly adherent thereto and are hard, tough, and flexible. Paper when coated with a continuous methocel film, resists the penetration of oils and greases even at elevated temperatures.

Methocel surface sizings are particularly effective in preventing penetration of gloss inks and label varnish. Quantities as small as 0.1-0.2 pounds per thousand square feet cause a marked increase in gloss of the printed or varnished sheet.

Although the first attempts to methylate cellulose were carried out nearly 35 years ago, it was not until recent years that water soluble forms of this derivative were available for commercial use. Imported under such trade names as Tylose, Colloresine, Glutolin, and Rhomellose, water soluble methylcellulose was too expensive to receive more than academic interest from the paper industry. However, methylcellulose is now produced in a more economical price range in this country. It is the object of this article to discuss the properties of the domestic material, available under the trade name Methocel, and to suggest possible uses in the paper industry.

Methocel is obtained in a manner similar to that used in the preparation of other ethers of cellulose. Alkali cellulose is first prepared by treating cotton or wood cellulose with aqueous sodium hydroxide. After suitable aging to obtain the necessary viscosity reduction, this material is treated with dimethyl sulphate or methyl chloride. Depending upon the degree and uniformity of alkylation, methylcelluloses may be obtained which exhibit great diversity in their behavior toward solvents. When the degree of substitution is limited to 0.1-1.0 methoxyl group (OCH_3) per $C_6H_{10}O_5$ unit, the product is soluble only in dilute aqueous alkaline solutions, either in the cold or at room temperature. Between 1.0-2.0 methoxyl groups per $C_6H_{10}O_5$ unit, water soluble derivatives appear. As the degree of methylation approaches the trimethyl derivative, solubility in organic solvents occurs.

Properties

General Properties of Methocel

Methocel is being manufactured at present only as a water soluble type which represents approximately the dimethyl ether of cellulose. This derivative, a white fibrous solid, dissolves in cold water yielding neutral solutions which are odorless, colorless, and nontoxic. It is insoluble in hot water and the common organic solvents and is unaffected by oily or greasy materials of animal, vegetable, or mineral origin. Methocel is resistant to the action of alkalies and dilute acids.

Aqueous Solutions

Methocel dissolves readily in water to give clear, colorless, haze-free solutions. This may be accomplished with little difficulty by first thoroughly wetting the material with hot water (80-100 deg. C.). The mixture is then cooled to room temperature or below, preferably 5-10 deg. C., and is stirred until a smooth solution results. Since Methocel may be suspended in hot water for prolonged periods of time without harmful affect, this latter operation need not be hastened. Gradual cooling, overnight, may be preferred for convenience.

The initial use of hot water is to be emphasized in order to hasten solution. Such pretreatment promotes uniform penetration and wetting of the entire mass. In contrast, if the water used in the initial treatment is too cool, the outer surface of the particle becomes coated with a swollen gel consisting of partially dissolved methylcellulose. This condition retards subsequent penetration of water into the aggregate. As a result, after cooling, an excessive period of time is required to effect complete solution.

If the final solution appears turbid, this would indicate that the cooling operation has not been carried to a sufficiently low temperature. When correctly prepared, these solutions are stable on long standing and ordinarily do not require a preservative.

Aqueous solutions are not affected by changes in acidity or alkalinity over a *p*H range of 2 to 12. They are, however, coagulated by the addition of solutions of certain soluble salts, such as the sulphates, chlorides, and nitrates. Several others, including the soluble iodides and thiocyanates act to retard gelation of Methocel, when heat is applied to aqueous solutions containing them.

Viscosity Types

It is a generally accepted fact, that the viscosity of solutions of cellulose or its derivatives is proportional to the molecular chain length. Because the numerous and varied uses of paper require the maximum physical properties possessed by the cellulose, the pulp manufacturer strives to avoid, as much as possible, any treatment which might reduce the size of these

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 19-22, 1940.

[1] Cellulose Products Division, The Dow Chemical Co., Midland, Mich.

[2] Trade Mark Reg. U. S. Pat. Off.

chain molecules. In contrast, it is usually necessary for the producer of cellulose derivatives to modify the chain structure in order that the solution viscosity will meet the demands of varied use requirements.

Accordingly, Methocel is available in six viscosity types as listed in Table I which make possible a wide range of solution viscosities. Table I shows the average viscosity of a 2 per cent aqueous solution of each type in centipoises at 20 deg. C. The viscosity limits, within which each type is furnished, are given in the last column of the table. The low and the medium types are recommended, where high solids content and low solution viscosity are desired. The high and extra high types are most suitable in applications, where viscous solutions are desired with a minimum solids content. Final choice of the correct viscosity type for a specific application is best determined by experiment.

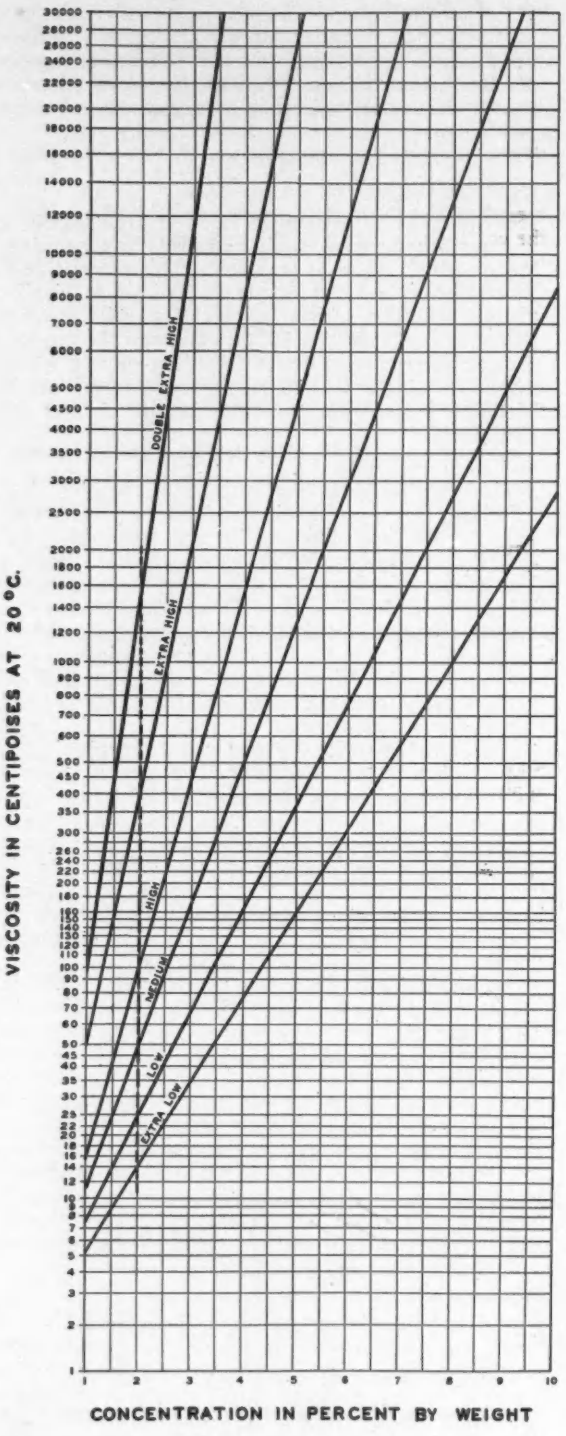

FIG. 1.
Methocel Viscosity-Concentration Chart

TABLE I.—METHOCEL VISCOSITY TYPES

Absolute viscosity (*1*) of 2% aqueous solutions at 20 deg. C.

Viscosity type	Viscosity of 2% soln. in cps., average	limits
Extra low	15	14-18
Low	25	20-30
Medium	50	40-60
High	100	80-150
Extra high	400	250-500
Extra extra high	1500	1000-2000

The relation between solution viscosity and concentration of the various viscosity types of Methocel in water is shown in Fig. 1, on which the steeply sloping lines represent the average viscosity obtainable with each type.

The relation between solids content and viscosity is further illustrated by the data of Table II. This shows the concentration in percentage by weight of each viscosity type required to give aqueous solutions having one of four widely different viscosities. The values cited in Table II were tagen from Fig. 1 and represent the average concentration of each type necessary to obtain solutions of the viscosity indicated.

TABLE II.—SOLIDS CONTENT OF AQUEOUS METHOCEL SOLUTIONS

Viscosity type	Approx. concentration in % by weight of Methocel to yield solution viscosity of 25 cps.	300 cps.	1000 cps.	10,000 cps.
Extra low	2.6	6.0	8.0	12.8
Low	2.0	4.7	6.4	10.3
Medium	1.5	3.5	4.7	7.6
High	1.2	2.7	3.6	5.8
Extra high	0.9	1.8	2.4	3.8
Extra extra high	0.4	1.3	1.8	3.0

Gelation Temperature

When a cold solution is heated, its viscosity decreases rapidly at first; a point is eventually reached at which small increases in temperature produce a rapid increase in viscosity. Within a range of a very few degrees, the solution is transformed to a firm gel. The temperature at which this occurs is referred to as the gelation temperature or gel point. In general, the greater the concentration of Methocel, or the higher the viscosity type, the lower will be the temperature at which gelation occurs. In other words, thin solutions gel at higher temperatures than do heavy ones. The curve of Fig. 2 represents this change graphically for a 5 per cent solution of medium viscosity. Curves of similar slope are obtained for the other viscosity types, differing only in the temperature at which the gel point is reached. If the gel thus formed is cooled to room temperature, a smooth flowable solution is again obtained. The viscosity also assumes its original value. These properties remain unaffected by repeated heating and cooling of the solution.

The effect of the addition of soluble salts upon the solubility, viscosity, and gel point of methylcellulose solutions has been discussed by Heymann and his coworkers *(2)*. These authors have shown that the

solubility of methylcellulose in water decreases with the presence of NO_3, Cl, and SO_4 ions and increases with I and SCN ions. This order of decreasing solubility follows the lyotropic series, namely, SCN, I, NO_3, Br, Cl, and SO_4, in the order named. Cations exert no marked influence. Thus SO_4 ions have the strongest flocculating power, whereas those of sulphocyanate and iodide, in contrast, have a dispersing effect.

The addition of salts in concentrations insufficient to effect coagulation at lower temperatures results in an increase in solution viscosity. Here, also, the lyotropic series is valid. No generalizations can be made as the gel point is approached, since viscosity measurements in this region are unreliable because of thixotropy.

Gelation Temperature—Concentration Chart

The gelation temperature of aqueous solutions has been found to be dependent upon their concentration and intrinsic viscosity. In general, the greater the concentration or the higher the viscosity type, the lower will be the temperature at which gelation occurs.

The relationship between gelation temperature and concentration for the various viscosity types is shown in Fig. 3. The diagonal lines show the temperature at which various concentrations of each viscosity type are transformed to gels. The points at which the lines terminate at the higher temperatures indicate concentrations below which the solutions will not set to a gel regardless of the heat applied. The points of termination at the lower temperatures designate concentrations at which the solutions are so viscous that they do not flow.

Compatibility of Aqueous Solutions

Aqueous solutions of Methocel can be blended with aqueous dispersions of starch, glue, casein, rubber latex, dextrin, and water-dispersible natural gums. It is advisable, when making such mixtures, to prepare solutions of the individual constituents separately. This is particularly recommended when working with materials which are normally brought into solution by the aid of heat, such as starch and glue. Final blending should take place only after both the Methocel and the solution of the other material have

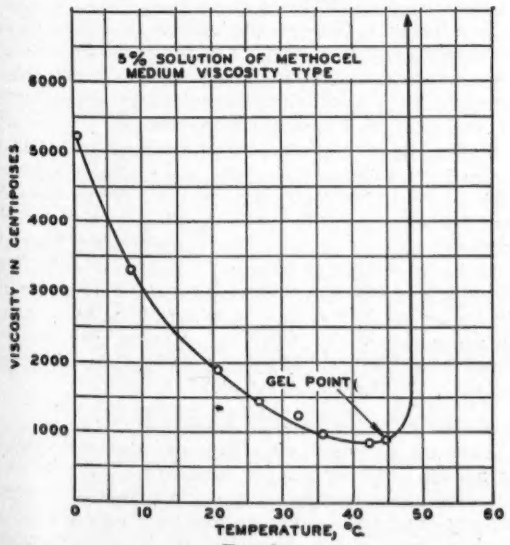

Fig. 2.
Effect of Temperature on Viscosity of an Aqueous Methocel Solution.

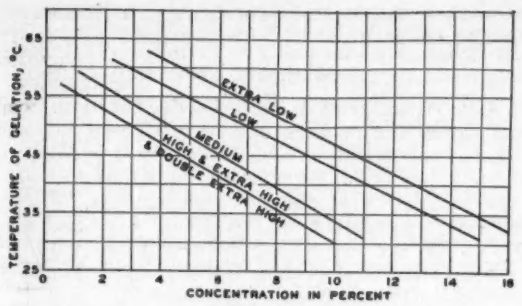

Fig. 3.
Gelation Temperature-Concentration Chart for Methocel Viscosity Types.

been brought to room temperature. For this reason, the concentration of the material selected to combine with the Methocel must be limited to that which will remain fluid at room temperature. This avoids the difficulty of attempting to blend a Methocel solution with another material, whose concentration is such that it is a gel at room temperature. If the suggested procedure is followed, it is possible to blend Methocel solutions in all proportions with those of glue, starch, and casein.

The incorporation of a plasticizer into the mixture may be desirable for certain use requirements. When this is necessary, it should be added to the solution before blending. Large proportions of the more common water soluble plasticizers such as glycol, diethylene glycol, glycerin, invert sugar, sorbitol, and mannitol may be added in this manner.

The addition of small proportions of ethyl alcohol to Methocel solutions increases their apparent viscosity and raises their gel point. The extent to which these properties vary will be determined by the viscosity type employed and the concentration of the solution. Preliminary experiment is usually necessary to determine these relationships for a specific application.

Plasticizers

Methocel coatings tend to be stiff when dried to their normal moisture content of about 5 per cent, even though they are capable of elongation of about 20 to 25 per cent. Inasmuch as some coating uses may require even greater pliability and softness, it is common practice to obtain these qualities by the addition of a plasticizer. Such agents help to retain a certain degree of moisture in the coating.

Although the final choice of a plasticizer will be largely influenced by the nature of a specific problem, it is important that a material possess certain general characteristics, if it is to be a suitable plasticizer. It should be soluble in water and impart no color to the solution when dissolved. Some degree of hygroscopicity is desirable. The material selected should have a high boiling point and be noncrystalline at room temperature. For most uses, it is also essential to consider the nature of its effect upon the physical properties of the sheet after application, particularly when special qualities are sought, such as greaseproofness.

Several plasticizers possess outstanding qualities and are recommended for general use. All are polyhydroxy compounds such as glycol or diethylene glycol, glycerine, sorbitol, and invert sugar. Ordinarily, from 15 to 30 per cent of plasticizer is required

to produce the desired flexibility and softness in the coating composition.

Methocel Uses

Aqueous solutions of Methocel deposit hard, tough, and highly flexible films on drying. These properties make it particularly adaptable as a coating for paper either alone or in combination with those materials now in use. The coatings are colorless, odorless, tasteless, transparent, and stable to heat and light. They will not decompose or deteriorate with age. One pound of Methocel applied as a coating 0.001 in. thick will cover 24,600 sq. in. of area.

In the development of Methocel as a paper-coating agent attention has been directed toward a number of specific uses. These include its application as a greaseproof coating, a base coat for label and gloss ink printing papers, and as a base coat for waxed paperboards.

Greaseproof Paper and Paperboard

Greaseproof Coating: Paper or paperboard when coated with a continuous film is converted to an oil- and grease-resistant material. Paper so coated will permanently resist the penetration of vegetable and mineral oils even at elevated temperatures.

No difference actually exists in the inherent greaseproofness[3] of the various Methocel viscosity types. Reference to the data in the upper portion of Table III indicates that comparable greaseproofness is obtained from 1.7 lb. of Methocel per 1000 sq. ft. regardless of viscosity type, provided the solution viscosity of each is approximately the same.

This point is further emphasized by reference to the lower portion of Table III in which the three viscosity types are compared at equal solution concentrations. The table shows that 1.5 lb. of XX high viscosity type per 1000 sq. ft. will give a greaseproof coating which will not fail in 120 hours. The same weight of coating deposited from a similar solution containing high viscosity Methocel failed at 120 hours. Failure within 24 hr. was obtained from a composition deposited from a 3 per cent solution containing as much as 3.5 lb. of low viscosity Methocel.

These differences are primarily related to the viscosity of the coating solution. The higher the viscosity of such a composition, the less will be the penetration into the paper during application. Since to secure greaseproofness, it is necessary to deposit the coating as a continuous surface film, it is apparent, that excessive penetration occurred in the case of the low viscosity type, even though the weight of coating applied was far in excess of the amount of high and XX high required for the same purpose.

Greaseproofness of the coating, therefore, appears to be directly related to the viscosity of the coating solution rather than to the viscosity type of Methocel, provided equal weights are applied. Direct advantages are thus to be obtained from the use of higher concentrations of the low or extra low viscosity types, since a smaller quantity of solution containing a higher solids content may be satisfactorily applied. In this way the amount of solids a given coating machine can deposit is increased with subsequent reduction in the amount of water to be removed.

The amount of coating required will depend primarily on the degree of greaseproofness desired and upon the paper being treated. It, therefore, becomes necessary in each initial greaseproofing application to prepare various weight coatings on the particular paper or paperboard in order to determine the exact need for a particular use. A slack-sized paper will require more than one which is hard sized, because the latter aids in preventing penetration of the coating solution. The presence of much fuzz will also demand an increased amount of coating in order to obtain coverage of protruding fibers and prevent wicking of the oil or grease through the coating. In general, the amount of Methocel required, will range from 1 to 2 lb. per 1000 sq. ft. of paper or paperboard.

The method of applying this grease proof coating will obviously depend on the coating equipment available. It can be deposited by roll coaters, or by means of doctor blades. Little success has resulted, to date, from attempts to apply a satisfactory greaseproof coating by addition from the waterboxes of the calender stacks. The excessive pressure of the rolls at this point prevents sufficient coating from being deposited upon the sheet. On the other hand, when added to prevent gloss ink penetration, the quantity required is so small that the calenders appear satisfactory from trial runs made to date.

Greaseproof Adhesive: Methocel when applied to paper from solution deposits a film which possesses a high degree of adherence to paper. This property, together with its greaseproofing characteristics, indicates its use as an adhesive for applying liners to paperboard, where greaseproofness is required. Two objectives are thereby accomplished by a single operation resulting in a saving of materials as well as cost of processing. The adhesive solution may be prepared from Methocel alone or combinations of Methocel with 10-20 per cent of glue.

Use in Paraffin Coated Paperboard

The use of small quantities of Methocel applied as a base coat on waxing paperboards results in a decrease in the amount of paraffin required for satisfactory coverage by preventing penetration into the stock. Outstanding, however, is the noticeable retention of opacity and whiteness after such treatment.

TABLE III.—RELATIVE GREASEPROOFNESS OF METHOCEL COATINGS

Viscosity type	Concentration by weight, %	Absolute Solution Viscosity (1), Centipoises	Doctor Clearance mils	Coating weight, lb. per 1000 sq. ft.	Greaseproofness[2]
Comparison of Viscosity types of equal solution viscosity					
Low	4.8	443	6	1.1	failed, 24 hr.
	4.8	443	8	1.7	greaseproof, 120 hr.
	4.8	443	12	1.8	greaseproof,[3] 120 hr.
High	3.0	439	10	1.2	failed, 96 hr.
	3.0	439	12	1.5	failed, 120 hr.
	3.0	439	15	1.9	greaseproof, 120 hr.
XX High...	1.5	418	18	1.3	failed, 48 hr.
	1.5	418	22	1.6	greaseproof, 120 hr.
	1.5	418	24	2.0	greaseproof, 120 hr.
Comparison of viscosity types of equal solution concentration					
Low	3.0	80	20	3.5	failed, 24 hr.
	3.0	80	22	4.0	failed, 24 hr.
	3.0	80	24	4.8	greaseproof, 96 hr.
High	3.0	439	10	1.2	failed, 96 hr.
	3.0	439	12	1.5	failed, 120 hr.
	3.0	439	15	1.9	greaseproof, 120 hr.
XX High ..	3.0	4700	12	1.5	greaseproof, 120 hr.
	3.0	4700	15	2.0	greaseproof, 120 hr.

[1] Failure noted when cocoanut oil first appeared on the under surface of the paper.

[2] No penetration observation at this time interval.

[3] Samples of the paper tested were folded into small rectangular boxes 1½ by 2½ by ½ in. in size. The oil used for the test was then poured into the box in sufficient quantity to completely cover the bottom of the container. The time required at room temperature for penetration of the oil through the sheet was taken as the measure of the degree of greaseproofness.

This may permit a reduction in liner weight in amounts sufficient to cover the cost of the base coat.

Use in Gloss Ink and Varnish Label Papers

The demand for higher gloss of printing inks as a means of attracting attention to advertising copy has led to the increased use of gloss inks. It is generally known that prevention of penetration of these inks into the paper produces increased gloss, and efforts have been directed on the part of the papermaker to accomplish this by the use of surface sizings of various kinds. It has been found that the use of very small quantities of Methocel applied in this manner are extremely effective in holding ink or varnish on the surface of the paper, primarily because of the oil- and solvent-resistant nature of the coating. The inert and colorless nature of such coatings permits the use of inks of any color without fear of change in shade during printing.

Quantities as little as 0.1-0.2 lb. per 1000 sq. ft. of surface produce a marked improvement in the final gloss of the ink used for overprinting. Variations are to be expected, because a paper which is well sized and free of fuzz will require less coating for satisfactory coverage. The use of a 3-5 per cent solution of the low or extra low viscosity types when applied on the calenders is preferred for ink or varnish applications. It has been found in most instances that solutions of this concentration contain sufficient solids to give a satisfactory surface coat for improved ink or varnish retention, although this will depend to a great extent upon the nature of the paper or paperboard being treated. If it is found that less solids are required, the use of a more dilute solution of the medium or high grade is suggested, in preference to one prepared from the low or extra low type. Use of the former results in a higher solution viscosity which in turn avoids excessive penetration into the sheet.

Since the amount of Methocel required for coatings of this nature is relatively small, it may be successfully applied at the calender stacks even though weights are used. If two stacks are employed it is preferable to apply the solution from the second one. In this way the paper receives a preliminary pressing which makes it less porous and more resistant to penetration of the coating solution. Economy of material thereby results.

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Plastics and Chemicals From Wood*

By Robert M. Boehm[1]

Abstract

A review of the number of products, made from wood and an indication of some ranges, where sufficient investigation has not been made, and where there is a need for new products to fill existing requirements.

At the start it might be well to mention that the term "wood" used in this article actually refers to lignocellulose, a term which embraces the entire field of wood and woody materials and which includes such woody growths as corn stalks, straw, bagasse, and similar raw materials. It is a broad field and one which justifies a great deal of study and thought. The goal which we should seek is first, the greatest possible utilization of our raw material, and second, the conversion of our raw material into as many products as possible. Masonite Corporation is only one of many large companies in the field of wood utilization, but it is unusual in that it is not only attempting to secure the most complete utilization of this raw material, but that it also has succeeded in producing the greatest range of products from the standpoint of density.

High and Low Density Products

A rather startling indication of the possibility of wood products with an extreme variation in the

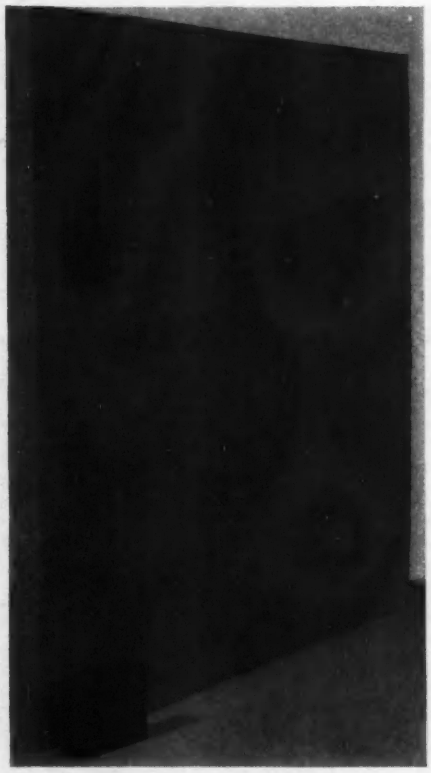


Fig. 1.

Comparison of Surface Area of Cellufoam and Benalite, Each of the Same Weight and Thickness.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 19-22, 1940.

[1] Member TAPPI, Director of Research, Masonite Corp., Laurel, Miss.

specific gravity is shown in Fig. 1. The large square has a surface of 4 sq. ft., is 1 in. thick, and weighs 200 g. or less than half a pound. This is Cellufoam, a comparatively recent development. The small square is Benalite, a lignin plastic which has a weight of over 90 lb. per cu. ft. The square is also 1 in. thick and weighs 200 g. but has an area of only about 8 sq. in. These two products represent practically the extremes possible. A product with a weight of 1 lb. per cu. ft. is certainly about the minimum density possible, and the Benalite with a weight of over 90 lb. per cu. ft. represents the ultimate specific gravity of lignocellulose. In other words this latter product has no voids left and is not further compressible regardless of the pressure applied. Between these two extremes lies a great range of products. It has been convenient to place these on the basis of variations in density (Fig. 2), and certainly there is no more justified method of presentation, since these represent how much wood substance is contained in a certain space and the properties which are secured in this manner.

Constituents of Wood

The products shown demonstrate practically pure wood fibers and not mixtures of wood with extraneous binders or molding materials except in comparatively few cases. Of course, it is possible to load wood fiber up with many materials and to secure densities beyond the range shown, but the products in the two extremes represent substantially 100 per cent wood.

Wood consists essentially of cellulose, lignin, hemi-

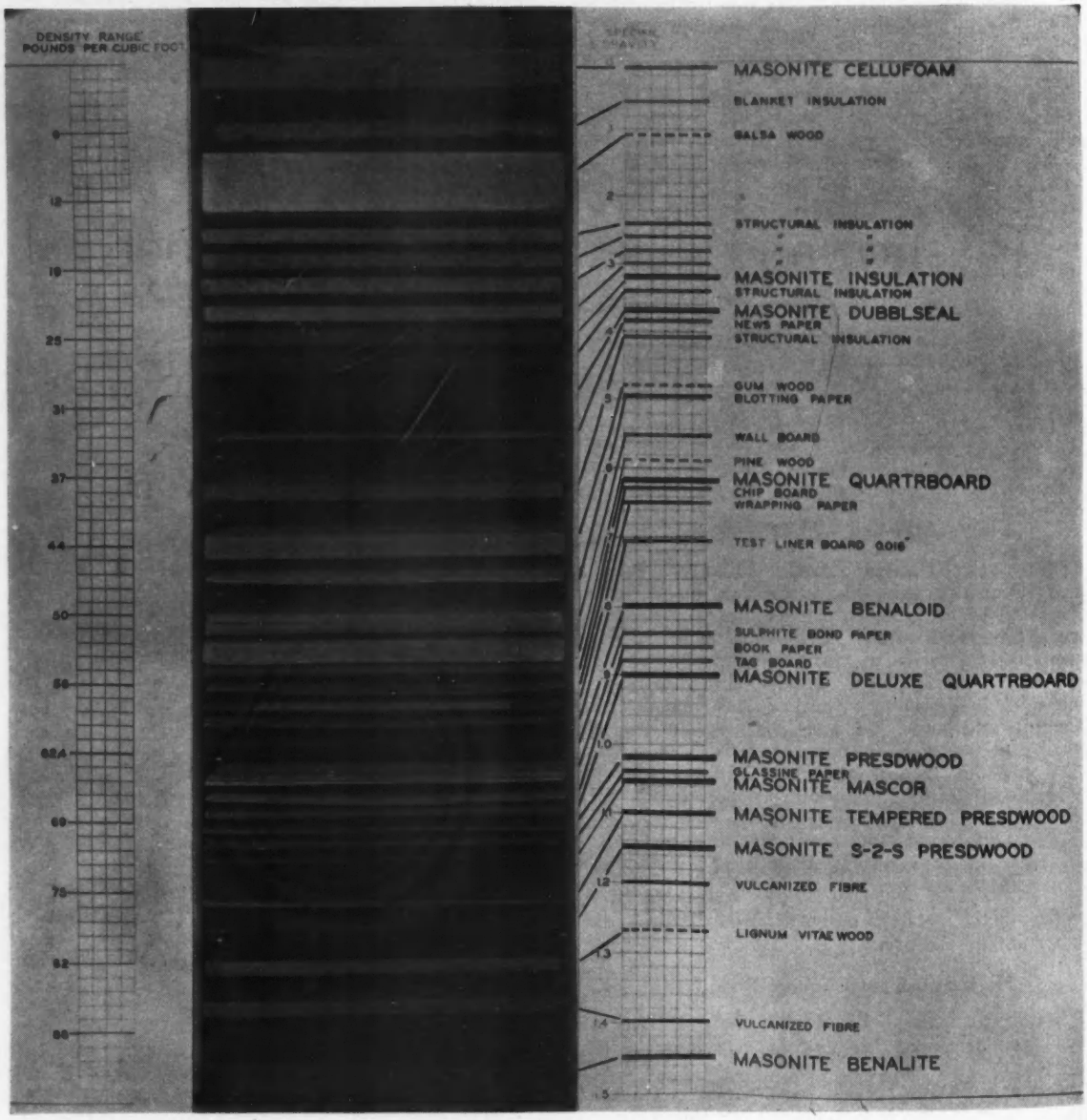


FIG. 2.

celluloses, and extractives. The extractives include wood sugars, tannins, rosin, and many other materials but for the purposes of the present discussion may be neglected.

Removing the Hemicellulose Matter

If the wood is freed of extractives, about 20 per cent of the balance consists of hemicelluloses. These materials are the anhydrates of the wood sugars and are grouped as pentosans and hexosans. On hydrolysis the pentosans are converted to xylose and arabinose, and the hexosans to glucose, mannose, and galoctose. In general, hardwoods are higher in pentosans and soft woods are higher in hexosans, but both are present in all cases. These are removable with more or less difficulty by solvents which normally act to convert the hemicelluloses to the corresponding sugars, whereupon they are separated by washing. In the acid digestion processes, this removal is relatively complete, but in the alkaline processes the final product usually contains appreciable quantities. The Masonite process, which can for the present be considered as a high temperature acid hydrolysis, removes substantially all of the hemicellulose matter.

Cellulose Era

Cellulose is the major constituent of the woody material amounting to about 50 per cent. It is the most widely used portion of the wood, and so many industries are now based on cellulose utilization, that this is rapidly becoming known as the cellulose era. In most of the industries represented here, it is very desirable to secure the greatest economical purification of the cellulose before converting it into the final products.

Removal of the Lignin

The balance of the woody material may be called the lignins. You will note that this is a rather rough classification, and the term lignins is being used in the generic sense rather than in the specific. A tremendous amount of work has been done on lignins in an effort to determine more of their chemical and physical characteristics, but our knowledge is so far from complete that we can truthfully say that we have only scratched the surface. Of course, part of this is due to the fact that lignins are the impurity, the unwanted stepchild, which the paper industry has been trying to eliminate. The removal of the lignin by converting it to compounds which are soluble or dispersed in water occupies practically all of the attention of the manufacturer of paper pulp. The resultant cellulose in its commercially pure condition represents about one-half of the starting wood substance, and the portions which are removed are in general run to waste, as in the acid digestion processes, or burned as in the alkaline processes. It is not necessary to more than mention the problems of stream pollution attendant upon the former method.

The Masonite Process

The normal Masonite process differs from the papermaking operation in that the lignins are not only retained but actually put to work. The lignins may be considered the binding material in the original wood, and by the explosion process the fibers are separated, not only without removal of the lignins but with a type of activation of this constituent. There is a good chance for argument as to the character of this activation, but certainly a portion of the lignin has been freed of its carbohydrate bonds, and the result can be classed as depolymerization of at least a portion of the lignin.

Lignin activated in this manner can be rewelded under the proper conditions of moisture, temperature, and pressure, and the resultant product has a "wood-type bond" resembling the bond in the original tree which is characterized by high strength, dry or wet. This is distinguished from what we term the "paper-type bond" which may have high strength dry but loses strength rapidly on becoming wet.

The formation of this wood-type bond has been utilized in the manufacture of the standard Masonite products. These products are formed from the exploded fiber on a modified Fourdrinier machine and pressed wet at temperatures of about 200 deg. C. and at pressures dependent on the product desired, the pressure being maintained until the moisture has been completely removed, whereupon the lignin bond has been remade resulting in products having high dry strength and high wet strength.

Remaking the Lignin Bond

The lignin bond can be remade at these temperatures only in the presence of moisture. However, upon increasing the temperatures at which consolidation occurs, a critical point is passed above which the lignins may be bonded in the absence of moisture. This has resulted in products of somewhat greater density and water resistance which are characterized by being smooth on both surfaces instead of having the familiar screen surface of the standard products which is caused by the necessity of providing a method for the escape of the steam formed in the wet pressing. Further study of this temperature range above the critical point led to the discovery, that if the lignins can be heated uniformly above the critical temperature, the pressure may be applied only momentarily to secure proper bonding. This has led to the continuous production of a hardboard product, wherein pressure is applied by rolls rather than in flat presses and consequently hardboards are now available 8 ft. wide and of any length desired.

Benalite

The rebonding of the lignin bears some resemblance to the manufacture of plastics from thermosetting resins. Once this bond has been properly made, it does not appear to be reversible under any normal treatment, in other words, a finished Piece of Presswood can not be defibered and remade so that it will be as good as it was the first time. It is apparent that in going through the activation of the lignins a change has been made which results in an irreversible reaction. This fact, together with the definite proof that the lignin passes through a plastic state, naturally led to an investigation of how far this plasticity could be developed, and what characteristics would be secured in a product made by first securing substantially optimum conversion of the lignin to plastic condition. The resulting product is the lignin plastics, Benalite, which has essentially the properties of a phenolic laminated plastic and which is competing with such materials in the various fields. This product represents the ultimate specific gravity of this lignocellulose material, and the

specific gravity is the same whether pressed under the normal pressures of about 1500 lb. per sq, in. or 10 times that amount.

This does not mean that we have reached the end of the possibilities of the lignin bond, but simply that we have reached the maximum possible density. At the present time, we are investigating making an activated carbon from wood which is hard and dense and equal in every respect to the better class of carbon from coconut shells. This is a very interesting development, because it may ultimately serve to make this country independent of imports of coconut shells for high grade activated carbons for use in industrial applications as well as in gas masks in case of a national emergency.

Cellufoam

At the other end of the scale from Benalite is the new product known as Cellufoam. So far as I know this is the lightest structure ever made from wood fiber and differs from the other products in that it is not characterized by a lignin bond. Its manufacture is very fascinating and deserves a brief description. Cellulose fiber, normally kraft, is disintegrated in water and a foaming agent is added. Upon violent agitation with injection of air, a very stable foam is formed with the cellulose fibers completely dispersed in the foam. Evidence is available that with the proper selection of foaming agent and of dispersing agents, the fibers gain a surface charge which causes them to repel one another and results in a beautiful dispersion throughout the foam. This foam is formed into a sheet on a modified Fourdrinier machine and is passed through a tunnel drier in which very high temperatures are used. This leads to dehydration, not only of the fiber but also of the foam and results in products comparatively good in water resistance and with very high insulating value. At the present time this product is only being used industrially, but progress is being made very rapidly with the expectation that products of this type may soon be available for general use in heat and sound insulation.

Insulation Boards

Passing through the range of low density insulation, we approach the types of products known commonly as structural insulation boards which fall in the general range of specific gravities of 0.24 to 0.40. In this range are structural insulation and Dubblseal insulation, both of which are characterized by the lignin-type bond and by extreme water resistance and wet strength. We next enter the wallboard range which can be roughly considered as between the specific gravities of 0.50 to 0.75. Many types of wallboard will be found in this range, most of which are composed of lignocellulose which has simply been dried in paper or board form, the thinner ones being laminated with various binders to give the desired thickness. Quarterboard, which has a specific gravity of about 0.62 and a thickness of ¼ in. differs from the others, in that it is homogeneous in structure and without extraneous binders, and the lignin type bond has been utilized.

Specific Gravities of Paper and Paperboard

Somewhat above this range we enter the field of densities of paper and paperboard products which are represented here by several examples and which in general fall in the range of specific gravities of from 0.60 to 0.90. These examples include chipboard with a specific gravity of approximately 0.60, mimeo and wrapping paper with a specific gravity of about 0.65, test liner with a specific gravity of about 0.70, sulphite bond with a specific gravity of about 0.85, book paper with a specific gravity of about 0.86, and tag board with a specific gravity of about 0.87. Some papers fall below this range, such as newsprint with a specific gravity of approximately 0.40 and blotting paper with a specific gravity of about 0.50. On the other hand, glassine paper is somewhat higher than the general range, having a specific gravity of about 1.00.

Hard Panel Boards

We now enter the range of hard panel boards covering specific gravities of about 0.90 to about 1.3. Included in this range are deluxe Quarterboard with a specific gravity of 0.90, Presdwood with a specific gravity of 1.03, Mascor with a specific gravity of 1.05, tempered Presdwood with a specific gravity of 1.1, and S2SPresdwood with a specific gravity of 1.2 (Fig. 2). All of these boards are characterized by the lignin-type bond, that of the deluxe Quarterboard, Presdwood, and tempered Presdwood being formed by application of high temperatures and pressures to the wet sheet, that of S2SPresdwood by application to the dry sheet of temperatures above the critical point, and that of Mascor by momentary application of pressure to a dry sheet in which the lignins have been preheated above the critical temperature.

Vulcanized Fiber

The next range of products represented here is vulcanized fiber with densities in the range of about 1.2 to 1.4. These are included from the standpoint of interest, although they represent a product in which the cellulose has been chemically altered.

This brings us back to Benalite with a specific gravity of 1.45 and which represents as far as we are now aware practically optimum utilization of the bonding powers of lignin.

It is interesting to mention briefly the strength ranges represented by these samples shown. It will be convenient to put these on the basis of tensile strength for obvious reasons, and it will be seen that we have covered a strength range of from 6 lb. per sq. in. in the case of Cellufoam through 200 lb. per sq. in. in the case of structural insulations, 600 lb. per sq. in. in the case of wallboards, 4000 lb. per sq. in. in the case of hard panel boards up to 10,000 lb. per sq. in. in the case of Benalite. Comparing our extremes, Benalite has a density practically 90 times as great as Cellufoam and a strength over 1500 times as great.

Variation in Parent Substance

Included in Fig. 1 are variations in the parent substance represented by balso wood with a weight of about 7 lb. per cu. ft. through gum wood with a weight of about 30 lb. per cu. ft. Longleaf pine wood with a weight of about 37 lb. per cu. ft. to lignum vitae wood with a weight of about 80 lb. per cu. ft. In other words, nature has succeeded in going from 7 to 80 lb. per cu. ft., a ratio of 11:1, while commercially we have succeeded in going from about 1 to 90 lb. per cu. ft., a ratio of 90:1.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING APRIL 27, 1940

SUMMARY

Wrapping paper .....5 cs.
Packing paper .....91 bls.
Filter paper .....7 cs.
Drawing paper .....6 cs.
Photo material .....53 pkgs., 375 cs.
Photo paper .....1 cs.
Surface coated paper .....44 cs.
Surface baryta coated paper and basic paper .....46 cs.

WRAPPING PAPER

Japan Paper Co., *Henri Jaspar,* Antwerp, 5 cs.

PACKING PAPER

——, *Westernland,* Antwerp, 91 bls.

FILTER PAPER

H. Reeve Angel & Co., Inc., ——, Liverpool, 7 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., ——, Liverpool, 6 cs.

PHOTO MATERIAL

Gevaert Co., of America, *Emile Francqui,* Antwerp, 53 pkgs., 375 cs.

PHOTO PAPER

W. I. Chudleigh, *Westernland,* Antwerp, 1 cs.

SURFACE COATED PAPER

Gevaert Co. of America, *Westernland,* Antwerp, 23 cs., (unfinished photo-paper).
W. I. Churleigh, *Westernland,* Antwerp, 21 cs., (unfinished photo-paper).

SURFACE BARYTA COATED PAPER AND BASIC PAPER

P. Puttmann, *Westernland,* Antwerp, 46 cs.

BAGS, BAGGINGS, ETC.

E. J. Keller Co., Inc., ——, Dunkirk, 390 bls. old bagging.
Darmstadt Scott & Courtney, ——, Dunkirk, 58 bls. old bagging.
Continental Bank Trust Co., *Henri Jaspar,* Antwerp, 77 bls. flax waste.
A. W. Fenton, Inc., *Ida,* Trieste, 25 bls. rags.
——, ——, Liverpool, 11 bls. thread waste, 159 bls. rags.
Continental Bank Trust Co., *Westernland,* Antwerp, 83 bls. flax waste.
J. Levy & Son, *Oriente,* Havana, 16 bls. rags.

PHILADELPHIA IMPORTS

WEEK ENDING APRIL 27, 1940

——, *Mormachawk,* Buenos Ayres, 25 bls. old rags.

NORFOLK IMPORTS

WEEK ENDING APRIL 27, 1940

Darmstadt Scott & Courtney, ——, Bombay, 133 bls. old rags.

Photoswitch Pilot Control

The Photoswitch Pilot Control made by Photoswitch Inc., Cambridge, Mass. is an electronic switch rendering possible control of large currents by delicate mechanisms, liquids, or extremely light contact pressure normally not capable of being used to control electrical currents. Control is effected by the delicate touching of two fine wires or contacts, or by their being short-circuited by a liquid or even any moist material. Only three millionths of an ampere may in this way control any current desired.

Photoswitch Pilot Control makes stop motion control positive on textile, paper, and wire machinery. On paper processing equipment for example, very sensitive feels ride the paper to detect tears. When a tear occurs the dropping feeler exerts extremely light contact pressure. This provides positive machinery control with the Pilot Control.

The Pilot Control also monitors automatic punch presses and machine tools.

New Time-Saving Catalog

For the first time it is said catalog data on a comprehensive line of piping and other specialties are now available in a single volume for the pulp, paper and chemical industries. Combining detailed information on special valves, couplings, thermometers, gauges, regulators, traps, controllers and other items designed especially for these industries, the new 142-page catalog just released by Grinnell Company, Inc. provides speedier, more convenient reference on such specialties than has ever before been available.

File copies of this new handbook, "Specialties for the Pulp, Paper and Chemical Industries", may be obtained by writing directly to Grinnell Company, Inc., Providence, R. I. or from local branch offices.

Discuss Oxford Papers

BOSTON, Mass., April 29, 1940—Harold Holden, general sales manager, and N. R. Hopkins, both of the Oxford Paper Company, New York City, whose plant is in Rumford, Me., discussed Oxford papers at a sales meeting of Carter Rice & Co., Corp., at the Parker House Saturday morning. Frank H. Winter, sales manager of the Carter Rice Company, presided, with representatives of the Boston, Worcester and Springfield, Mass., and Providence, R. I., offices attending. A breakfast at 7:45 o'clock preceded the sales meeting.

Minimum Wage Hearing May 20

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 1, 1940—A public hearing on the 40-cents-an-hour minimum wage recommendation of the Pulp and Primary Paper Industry committee under the Fair Labor Standards Act, will be held beginning May 20, Administrator Philip B. Fleming of the Wage and Hour Division, U. S. Department of Labor, has announced.

The hearing will be before Henry T. Hunt, Principal Hearings Examiner of the Division. Should the recommended minimum wage be approved by the Administrator, it would increase the hourly wage rate of 8,425 workers of the industry which employs approximately 129,000 wage earners.

The report was signed by John A. Lapp, chairman, and nine members of the committee. A minority report signed by six members of the committee was also forwarded to Colonel Fleming.

"Although some portions of the industry would bear a greater wage bill increase than others," the majority report said, "a 40-cent minimum would not result in a very large increase in the wage bill of any substantial group of mills.

"The direct effect of raising wages of all workers to 40 cents an hour would be to increase the wage bill of mills which are primarily engaged in making wrapping paper by 0.70 per cent, and the corresponding increases in pulp, writing paper and paperboard mills would amount to 0.60 per cent, 0.53 per cent, and 0.47 per cent, respectively."

The minority report dissented from the recommendation of the majority as one which would result "in the actual liquidation of a number of these small establishments, and the practical economic liquidation of the communities now supported by those mills."

Any person wishing to appear at the hearing on May 20, either supporting or opposing the recommendation of the committee, may appear, either in his own behalf or on behalf of any other person; providing that not later than May 15, any such person shall file with the Administrator a notice of his intent to appear which shall contain the name and address of the person appearing; if such person is appearing in a representative capacity, the name and address of the person or persons whom he is representing; whether such person proposes to appear for or against the recommendation of the committee; and the approximate length of time requested for his presentation.

Robert E. Read Inc. to Increase Stock

[FROM OUR REGULAR CORRESPONDENT]

DEXTER, N. Y., April 29, 1940—A majority of the stockholders of the Robert E. Read, Inc., moulded pulp products, have voted to amend the incorporation certificate in order to increase the number of common stock A shares from 3,000 to 4,200 and the common stock B shares from 200 to 800 shares. Under the new financial arrangement the company expects to be operating to capacity within the next few weeks, according to announcement. It was stated that there was no opposition to the proposition which the company stockholders considered at the meeting. About 25 workers are employed at the plant when it is operating full time. The concern produces meter packing for the General Electric Company, can packings for midwest canning companies and pre-forms for plastics developments.

J. D. Fleming now Sales Manager of Grinnel Co.

James D. Fleming has been appointed vice-president and sales manager of the Grinnell Company, Inc., Providence, R. I. Previous to this appointment,

JAMES D. FLEMING

Mr. Fleming was vice-president and manager of the Grinnell Company of the Pacific, a subsidiary. He has been associated with that company since 1919. He will continue to manage the Pacific Company but will be located at the Company's home office at Providence, R. I.

Paper Wanted for Printing Currency

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 1, 1940—Secretary of the Treasury has announced that proposals are being invited for furnishing distinctive paper required for printing currency and public debt securities of the United States during the fiscal year 1941, for which bids will be opened at the Treasury Department on May 16.

The estimated quantity required for currency is 89,716,000 sheets, or about 1,084 tons of paper. No estimate is made of the requirements for public debt securities.

Pangara Corp. Elects Officers

At the annual meeting of the Pangara Holding Corporation Ltd., Toronto, the following directors were elected. Donald Guthrie, R. J. Hart, W. S. Edwards, Harold Boyle, Gordon Mitchell, T. Linsey Crossley, K. S. Sweetman. The directors subsequently elected Guthrie president, Mr. Sweetman secretary treasurer, and Mr. Crossley technical director.

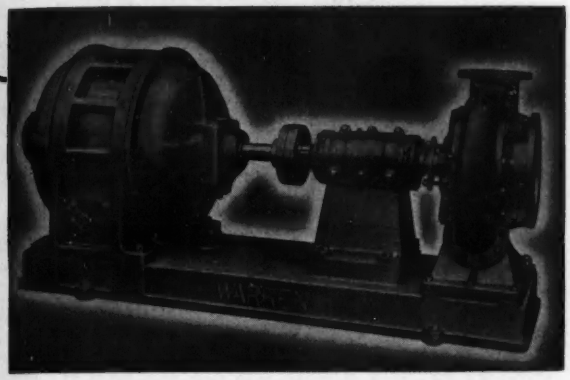
Plans for the erection of a mill to utilize apple prunings are under consideration. The pulp produced from apple and other fruit tree prunings has been found to have valuable special qualities for fine papers.

T. & H. Remodel Boston Office

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., April 29, 1940—Tileston & Hollingsworth, paper manufacturers, whose mill is in Hyde Park, are remodelling their Boston office, so as to give more space with an inter-office communication system, making for greater efficiency.

How to plan a pump replacement program that will PAY ITS WAY



If any of your pumps have been in service for ten or more years, you'll be interested in Warren's "Pump Audit"—the new method of getting straight facts on your actual pump economy. You may find "faithful" old pumps using excessive power, causing avoidable maintenance, wasting hundreds of dollars per year. The "Pump Audit" will spot the power wasters, enable you to plan a replacement program that will pay its way out of savings.

Write for full information on
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the factual method of analyzing pumping costs and planning a sound replacement program.

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TANKS *TO MEET YOUR SPECIAL REQUIREMENTS*

★ANY SHAPE, ANY SIZE

Propeller Agitator Tank — drawing of Glazed Tile Tank with midfeather arranged for propeller agitation.

Kalamazoo Glazed Tile Tanks are ideal for all types of paper stock chests.

They are stronger, cleaner, more durable, and more economical than any tank made. Built for your individual requirements.

Manufacturers of wood tanks for 60 years.

GLAZED TILE

KALAMAZOO TANK & SILO CO.
KALAMAZOO, MICHIGAN

WOOD

New York Paper and Pulp Market Review

Contract Prices On Chemical Wood Pulp Advanced This Week With No Shipments Reported From Scandinavia — Lower Grades of Kraft Paper Up — No. 1 Mixed Paper Advanced — Other Markets Rather Slow.

Office of the PAPER TRADE JOURNAL,
Wednesday, May 1, 1940.

The wholesale paper market is firm and reports received form many manufacturers' representatives, jobbers, and general paper merchants indicate that sales for practically all paper and paper products is being well maintained. The outlook for the paper industry and trade is generally viewed as excellent, with a higher price level in prospect for the current year than prevailed during most of the past year. The critical pulp situation in the Scandinavian countries, has introduced the elements of confusion and uncertainty in the pulp market, and this has exerted considerable influence on the paper market. Although adequate supplies of pulp are reported by many mills, a substantial increase in demand for paper would produce a very acute situation during the next few months. An acceleration of the inflation movement is expected by some economists to continue moderately and the trend of pulp, paper and commodity prices in general are headed upward.

The index of general business activity for the week ended April 20 declined to 93.2 per cent, from 93.3 per cent for the preceding week, compared with 86.2 per cent for the like period last year.

Paper production for the week ended April 20 was estimated at 88.8 per cent, compared with 82.8 per cent for 1939, with 67.4 per cent for 1938, with 90.9 per cent for 1937, and with 83.1 per cent for the corresponding week in 1936.

Paper board production for the week ended April 20 was 72.0 per cent, compared with 69.0 per cent for 1939, with 59.0 per cent for 1938, with 89.0 per cent for 1937, and with 68.0 per cent for the like period in 1936.

No important announcement of any change in the list prices of any grade of white paper has been reported to date. Kraft paper has advanced and former discounts have been eliminated. The kraft price situation is somewhat confused but the average representative quoted market prices are as follows: Northern, extra quality, $5.00 to $5.50; superstandard, $4.62½ to $5.00; Northern standard wrapping, $4.37½ to $4.62½; standard wrapping $4.25 per cwt.

Orders for kraft paper are reported substantially higher than current production.

Mechanical Pulp

No change of importance has been reported in the mechanical pulp market this week. Prices continue unchanged at prevailing market levels.

Chemical Pulp

No pulp is being shipped from Scandinavian countries this week and the foreign pulp situation continues critical. Mill stocks of wood pulp are reported ample for the present, with all the larger paper producers reporting large stocks in storage, some mills having one to two years supply in storage. The chemical pulp market is very firm with talk in some quarters of the trace of increasing scarcity.

Prices on chemical wood pulp have ben revised upward this week. Prime bleached domestic and foreign sulphite, is currently quoted at from 3.00 to 4.15; prime, easy bleaching sulphite, at from 2.75 to 3.60; strong unbleached sulphite, at from 2.75 to 3.50. Bleached kraft is currently quoted at from 3.37½ to 3.75; light and strong kraft, at from 2.50 to 3.60; No. 1 kraft, at from 2.50 to 3.50; domestic and Canadian kraft, at from 2.50 to 3.00.

Some of the large domestic paper manufacturers who produce their own pulp and have a surplus of certain grades at times, have recently sold some large lots for export. One such manufacture rsold 500 tons of soda pulp for export to Scotland. Orders for two lots of kraft pulp for export to Australia, one of 1,000 tons and another for 1,500 tons have been reported this week.

Rags

Trading in paper-making rags is reported slow this week. No change from prevailing market prices has been reported on any grade of rags.

Old Rope and Bagging

Trading in old rope is reported slow. Foreign Manila rope is currently quoted at from 4.25 to 4.50; domestic Manila at from 3.25 to 4.00; jute threads, at from 2.62½ to 2.75; sisal strings, at from 2.10 to 2.35; and mixed strings at from 1.10 to 1.20.

Trading in old bagging is reported slow with no price changes reported this week.

Old Waste Paper

The paper stock market is firmer this week. Strictly folded news is up to .52½ to .57½; corrugated down to .50 to .55; and No. 1 mixed paper up to .37½ to .42½.

Twine

Prices are reported firm on all grades of hard and soft fiber twine for the current week, with moderate advances expected in the future on some of the imported fibers.

Frank Murphy Makes Change

Frank A. Murphy has terminated his association with the New York office of Kimberly-Clark Corporation and on May 1 joined the Beach & Arthur Paper Company, with New York office at 17 East 42nd street. The mill of the Beach & Arthur Paper Company, Paperville, Pa., is forty miles west of Philadelphia. The principal production is lightweight sulphite papers but some changes are contemplated and made-to-order specialties will be added to the company's line.

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PALMETTO Twisted Packing is a most convenient packing for one size fits all size valves. Every strand, in fact every thread is a complete piece of packing in itself, twisted long fibre asbestos, thoroughly impregnated with a special lubricant that keeps the fibre soft and pliable and reduces friction. Unstranding gives you the desired size for packing small valves. The plaited and braided packings are just as thoroughly lubricated but naturally cannot be reduced in size as can PALMETTO TWISTED.

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for steam, air, hot fluids

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for alkalis

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for acids

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Send for a sample of Greene, Tweed Packing to test in service. We base our claim for your business on tightness, length of life and minimized shaft wear.

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RUMORS!

RUMOR has it that some clays are as good as other clays—you, as a paper manufacturer, know that this is not so when you consider Quality China Clays from England . . . They are the standard by which other clays are measured.

RUMOR has it that you can substitute this clay for that clay with perfect satisfaction . . . If you are speaking of FINEST CHINA CLAYS FROM ENGLAND—*YES* . . . There are certain English clays you can substitute readily one for the other, due to their natural quality and uniformity . . . BUT, *not so*, with other clays—as a paper manufacturer, you, of course, know this.

RUMOR has it that due to the war, shipments of QUALITY CLAYS FROM ENGLAND have been "restricted—curtailed—impeded" and so on . . . Even a casual investigation will show you that this is *not* the case . . . There is sufficient tonnage of these CLAYS OF KNOWN QUALITY in the United States today (and arriving regularly) to handle all requirements, plus . . . Make inquiry to any clay importer, or any company using such clays—you will learn the truth of this statement immediately . . .

Don't let RUMORS mislead you.

For SERVICE, SATISFACTION and ECONOMY

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, May 1, 1940.

BLANC FIXE—Prices on blanc fixe are firm and continue unchanged at prevailing market quotations. The pulp is currently quoted at $35 per ton, in barrels, at works. The powder is offered at $50 per ton, f.o.b., works.

BLEACHING POWDER—Quotations on bleaching powder are firm. Demand reported moderate. Quotations unchanged. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Demand for casein is reported good for this week. Prices on some grades are a little higher. Standard domestic casein, 20-30 mesh, is currently quoted at from 10½ to 11 cents per pound, 80-100 mesh, at from 11 to 11½ cents per pound. All prices in bags, car lots. Argentina casein is currently quoted at 9¾ cents per pound; French casein at from 14½ to 15 cents per pound.

CAUSTIC SODA—Quotations on caustic soda are firm and unchanged for the week. Demand reported steady. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay are firm and continue unchanged at prevailing market levels. Domestic filler clay is currently quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Demand moderate. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported as firm, with prices on some grades lower for the week. "G" gum rosin is currently quoted at $4.60 per 280 pounds, gross weight, in barrels, Savannah. "FF" wood rosin is offered at $4.50 per 280 pounds, gross weight, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.63 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices on salt cake are firm under a moderate demand. Prices are unchanged. Domestic salt cake is currently quoted at $17 per ton, in bulk; chrome salt cake at $16 per ton; all prices nominal, in car lots, f.o.b., shipping point. Imported salt cake quoted at $20 per ton is nominal.

SODA ASH—Quotations on soda ash are firm and continue unchanged at prevailing market levels. Demand moderate. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Quotations on corn starch are higher for the week. Pearl is currently quoted at $2.80 per 100 pounds; powdered starch at $2.90 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Prices on sulphate of alumina are firm and the market reported as strong for the week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.60 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Quotations on sulphur are firm and unchanged at prevailing market prices. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Prices on talc are firm under a moderate demand and conform to prevailing market quotations. Domestic talc is currently quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $23 to $45 per ton.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.00	@	$5.50
Superstandard	4.62½	"	5.00
Northern Standard Wrapping	4.37¾	"	4.62½
Standard Wrapping	4.25	"	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	"	—
White No. 1½	.70	"	—
White No. 2	.65	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.87½	"	—
Kraft	.80	"	—
Manila	.65	"	—
Unbl. Toilet, 1 M.	3.50	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	1.95	@	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mia. Ll. Chip	55.00	"	—
White Pat. Coated	67.50	"	—
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds			Ledgers		
100% Rag Ext. No. 1.	$39.10	@	$46.00	$40.25	@	$47.25
100% Rag	31.05	"	36.50	32.20	"	37.75
85% Rag	....	"	....	29.90	"	35.00
75% Rag	23.60	"	27.75	24.75	"	29.00
65% Rag	....	"	....	21.65	"	26.25
50% Rag	17.55	"	21.50	18.70	"	22.75
25% Rag	14.65	"	17.75	15.80	"	19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds			Ledgers		
No. 1	$8.95	@	$11.00	$10.10	@	$12.25
No. 2	8.05	"	9.75	9.25	"	11.25
No. 3	7.60	"	9.25	8.50	"	10.75
No. 4	7.30	"	9.00	8.50	"	10.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	8.35	"	9.50
No. 2 Offset	7.70	"	9.00
A Grade E. F.	7.50	"	8.75
A Grade S. & S. C.	7.75	"	9.00
B Grade E. F.	6.95	"	8.00
B Grade S. & S. C.	7.20	"	8.25
C Grade E. F.	6.65	"	7.75
C Grade S. & S. C.	6.90	"	8.00
D Grade E. F.	6.40	"	7.50
D Grade S. & S. C.	6.65	"	7.75

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	$38.00	@	44.00
Dry	38.00	"	44.00

(Delivered)

No. 1 Domestic and Canadian	40.00	@	42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.00	@	4.15
Prime Qualities—			
Easy-Bleaching Sulphite	2.75	"	3.60
Strong Unbleached Sulphite	2.75	"	3.50

(On Dock, Atlantic Ports)

Kraft Bleached	3.37½	@	3.75
Kraft Light & Strong	2.50	"	3.60
Kraft No. 1	2.50	"	3.50

(F. o. b. Pulp Mill)

Kraft Domestic and Canadian	2.50	"	3.00

(Delivered)

Soda Bleached	2.90	"	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	7.25	@	7.50
Silesias No. 1	4.50	"	4.75
New Unbleached	6.50	"	6.75
Blue Overall	4.75	"	5.00
Fancy	2.25	"	2.50
Washables	2.00	"	2.15
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.15	"	3.35

Old Rags

White, No. 1—			
Repacked	3.25	"	3.50
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.75	"	1.90
Roofing Rags—			
No. 1	1.10	"	1.15
No. 2	.80	"	.85
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.61
No. 5A	.60	"	.65

Foreign Rags

All prices nominal.

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxford	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

The Nekoosa Portable Wood Peeler Readily Adaptable to Varied Conditions

It is easy to feed the Nekoosa Portable Peeler.

The Nekoosa Peeler is the result of years of development work. Mechanical features have been tested month after month and year after year. They have been tried and proved. They are no experiment and we are now offering this equipment with the customary machinery builder's guarantee.

Equipment of this kind must be built to stand severe service —The Nekoosa Peeler is built with this fact in mind.

Nekoosa Foundry & Machine Works, Inc.

NEKOOSA, WIS., U. S. A.

The Textile-Finishing Machinery Co.

Providence, R. I.

New York Office
50 Church St.

Southern Office
Johnston Bldg., Charlotte, N. C.

No. 4 White Linens	2.25	@	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.75	@	3.00
Domestic	2.50	"	2.75
Wool Tares, light	2.00	"	2.25
Wool Tares, heavy	2.12½	"	2.25
Bright Bagging	2.25	"	2.50
Manila Rope—			
Foreign	4.25	"	4.50
Domestic	3.75	"	4.00
Jute Threads	2.62½	"	2.75
Sisal Strings	2.10	"	2.35
Mixed Strings	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1	2.25	@	2.50
Soft White No. 1	1.80	"	1.90
Soft White Extra	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag	1.00	"	1.10
Solid Flat Book	.70	"	.75
Crumbled No. 1	.70	"	.75
Ledger White Stock	1.70	"	1.80
Ledger Stock Colored	1.05	"	1.15
Manila—			
New Env. Cut	1.70	"	1.80
New Cuttings	1.30	"	1.40
Old Kraft Machine	1.30	"	1.40
Compressed bales	1.05	"	1.15
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue	.70	"	.75
Strictly Folded	.52½	"	.57½
Corrugated	.50	"	.55
No. 1 Mixed Paper	.37½	"	.42½

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.18½	@	—
White Hemp	.18½	"	—
Fine Polished—			
Fine India	.23	"	—
Unpolished—			
Box	.14¾	"	—
Paper Makers	.15	"	—
Tube Rope	.16¼	"	—
Wall Paper	.15¾	"	—
Wrapping	.18	"	—
Soft Fiber Rope	.16¼	"	—
Cotton	.21	"	—

(Hard Fiber)

Medium Java	.19	"	—
Mex. Sisal	.16	"	—
Manila	.24	"	—

Domestic	2.50	"	2.75
Sisal Rope	2.20	"	2.50
Mixed Rope	.85	"	1.00
Transmission Rope—			
Foreign	3.50	@	—
Soft Jute Rope	3.00	"	3.25
Manila Rope—			
Foreign	4.25	"	4.50
Jute Carpet Threads	1.50	"	1.75
Gunny Bagging—			
Foreign	2.75	"	2.85
Domestic	2.50	"	3.00
Bleachery Burlap	3.50	"	3.75
Scrap Burlap—			
Foreign	2.60	"	2.65
Domestic	2.50	"	—
Scrap Sisal	2.25	"	2.50
Scrap Sisal for Shredding	2.30	"	2.65
Wool Tares, Heavy	2.50	"	2.65
New Burlap Cuttings	3.25	"	3.50
Aust. Wool Pouches	3.00	"	3.25
Heavy baling bagging	2.60	"	2.90
Paper Mill Bagging	1.75	"	2.00
No. 2 Bagging	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	—	@	.03
Fancy Percales	.04	"	.04¼
New White No. 1	—	"	.07½
New Light Flannelettes	.05	"	.05¼
Silesias No. 1	.05	"	—
New Black Silesias	3.20	"	3.25
Soft Unbleached	.07	"	.07½
Blue Cheviots	.05	"	.05½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls	.04¾	"	.05
New Black, Soft	.03	"	.03¼
Khaki Cuttings	.03	"	—
O. D. Khaki	.03	"	.03½
Corduroy	.02¾	"	.03
New Canvas	.06¾	"	.07¼
B. V. D. Cuttings	.07	"	.07½

Domestic Rags (Old)

(F. o.b. Boston)

White No. 1—			
Repacked	—	"	2.75
Miscellaneous	2.00	"	2.50
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues	1.50	"	2.00
Old Blue Overalls	1.60	"	2.00
Thirds and Blues—			
Repacked	—	"	1.25
Miscellaneous	—	"	1.00
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.00	"	1.25
No. 2	—	"	1.10
No. 3	—	"	.90

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons	(nominal)		
Dutch Blues	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians	(nominal)		
Old Linsey Garments	(nominal)		
New Silesias	(nominal)		

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f.o.b. Phila.)

Shirt Cuttings—			
New White No. 1	.07¼	@	.07½
New White No. 2	.04	"	.04½
Light Silesias	—	"	.04½
Silesias, No. 1	—	"	.04½
Black Silesias, soft	—	"	.03¾
New Unbleached	.05½	"	.06
Washable, No. 1	—	"	.04
Blue Overall	.04½	"	.05
Cottons—According to grades—			
Washable No. 2	—	"	.01¾
New Blue	—	"	.01¾
Fancy Percales	—	"	.03
New Black Soft	—	"	.04
New Light Seconds	.04½	"	.05
New Dark Seconds	—	"	1.55
Khaki Cuttings—			
No. 1 O. D.	.03¼	"	.03½
No. 2 Mixed	.02½	"	.02¾
Corduroy	—	"	.03
New Canvas	.05½	"	.06
New Black Mixed	—	"	.03

Domestic Rags (Old)

White No. 1—			
Repacked	3.25	@	3.75
Miscellaneous	2.50	"	2.75
Thirds and Blues—			
Miscellaneous	1.50	"	1.55
Repacked	1.75	"	2.00
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	—	"	.90
Domestic No. 2	—	"	.80
Roofing Bagging	—	"	.70

Bagging

(f.o.b. Phila.)

Gunny, No. 1—			
Foreign	Nominal		
Domestic	2.25	@	2.75
Manila Rope	—	"	4.50
Sisal Rope	1.75	"	2.00
Mixed Rope	1.00	"	1.25
Scrap—			
No. 1	2.50	"	2.75
No. 2	1.10	"	1.15
Wool Tares, heavy	3.50	"	3.70
Mixed Strings	.75	"	1.00
No. 1 New Light Burlap	3.00	"	3.50
New Burlap Cuttings	2.00	"	2.25

Old Papers

(f.o.b. Phila.)

Shavings—			
No. 1 Hard Write	2.25	@	2.30
No 2 Hard White	2.00	"	2.10
No. 1 Soft White	1.85	"	1.90
No. 2 Soft White	1.50	"	1.60
No. 1 Mixed	.90	"	1.00
Solid Ledger Stock	1.50	"	1.60
Ledger Stock, white	1.40	"	1.45
Ledger Stock, colored	1.10	"	1.20
No. 1 Books, heavy	.85	"	.90
Manila Cuttings	1.75	"	1.80
Print Manila	.50	"	.55
Container Manila	.40	"	.45
Kraft Paper	1.25	"	1.30
No. 1 Mixed Paper	.35	"	.40
Straw Board Chip	—	"	.40
Binders Board Chip	.40	"	—
Corrugated Board	.60	"	.65
Overissue News	.75	"	.80
Old Newspapers	.50	"	.55

BOSTON

Old Papers

(f.o.b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White	1.85	"	2.15
No. 2 Mixed	.75	"	.80
Solid Ledger Books	1.30	"	—
Overissue Ledger Stock	1.30	"	1.50
Mixed Ledgers	.85	"	.90
No. 1 Books, heavy	1.00	"	1.10
No. 1 Books, light	.65	"	.75
Crumpled Stitchless Book Stock	.55	"	.65
Manila Env. Cuttings	1.70	"	1.85
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News	1.40	@	1.50
No. 1 Kraft	1.25	"	1.30
Extra No. 1 Kraft	1.60	"	1.75
Mixed Papers	.22½	"	.25
Print Manila	.50	"	.55
Container Manila	.60	"	.70
Old Newspapers	.45	"	.50
Paper Wool Strings	.90	"	1.00
Overissue News	1.00	"	1.10
Box Board Chips	.35	"	.40
Corrugated Boxes	.45	"	.50
Kraft corrugated boxes	1.00	"	1.20
New Kraft Cuttings	1.75	"	2.00
Screening Wrappers	.60	"	.70

Bagging

(f.o.b.Boston)

Gunny Bagging—			
Foreign	2.75	"	2.85

CHICAGO

Waste Paper

(f.o.b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	2.40	@	—
No. 1 Hard White	2.15	"	2.20
No. 1 Soft White	1.85	"	1.95
Ledger and Writings	.85	"	.95
Solid Books	.95	"	1.05
Blanks	1.50	"	1.65
Krafts	1.15	"	1.35
New Kraft Cuts	1.40	"	1.50
Overissue News	.80	"	1.00
Old Newspapers—			
No. 1 Folded News	.65	"	.75
No. 1 Mixed Paper	.35	"	.55
Roofing Stocks—			
No. 1	.95	@	1.00
No. 2	.85	"	.90

Diesel-Electric Switcher for Hammermill

In the extensive yards of the Hammermill Paper Company, Erie, Pa., hundreds of thousands of cords of pulpwood are handled to and from the storage piles, constituting reserve supplies for the huge output of finished paper products. This wood and coal for the power plant and other carload lots of incoming material, as well as finished products, have for many years been handled there by a geared-type steam locomotive.

This motive power is now being replaced by a 65-ton 350-horsepower, diesel-electric switcher built by the General Electric Company in the same city. The new locomotive will be powered by two Cummins supercharged diesel engines governed at a maximum speed of 1500 rpm, and equipped with two General Electric generators, traction motors, straight and automatic air brakes, and accessory equipment.

To Be Sales Manager of Plastics Div.

The appointment of George C. Miller as sales manager of the Plastics Division of Carbide and Carbon Chemicals Corporation is announced. Mr. Miller has been associated with the Plastics Division activities since the early commercial development of "Vinylite" resins. He is familiar with all phases of the business and is well equipped to improve still further the service which this Division endeavors to render to all customers.